

# TOSHIBA

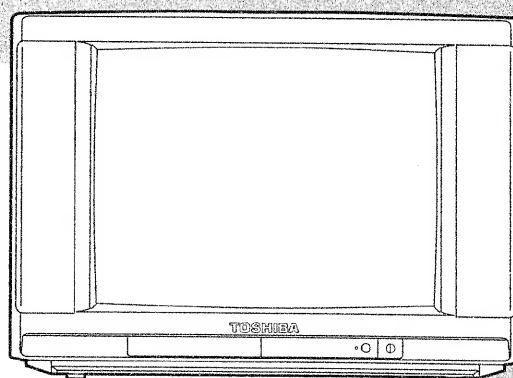
FILE NO. 060-9717

## SERVICE MANUAL

# COLOUR TELEVISION

S7ES Chassis

# ***2975DE, 2975SH***



PRINTED IN JAPAN. Dec., 1997 ©SD

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## CHAPTER 1 GENERAL ADJUSTMENTS

### SAFETY INSTRUCTIONS

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

#### X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is Ⓐ kV at zero beam current (minimum brightness) under a Ⓒ V AC power source. The high voltage must not, under any circumstances, exceed Ⓑ kV.
2. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
3. Some part in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

Refer to table-1 for high voltage Ⓐ, Ⓑ & AC voltage Ⓒ.  
(See SETTING & ADJUSTING DATA on page 19)

Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure in this manual. It is recommended that the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.

#### SAFETY PRECAUTION

**WARNING :** Service should not be attempted by anyone unfamiliar with the necessary precautions on this receiver. The following are the necessary precautions to be observed before servicing this chassis.

1. An isolation transformer should be connected in the power line between the receiver and the AC line before any service is performed on the receiver.
2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled. Use shatter proof goggles and keep picture tube away from the unprotected body while handling.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.

#### PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire, X-ray radiation or other hazards.

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

## SET-UP ADJUSTMENT

- The following adjustments should be made when a complete realignment is required or a new picture tube is installed. Perform the adjustments in order as follows :

1. Color Purity
2. Convergence
3. White Balance

Note: The PURITY/CONVERGENCE MAGNET assembly and rubber wedges need mechanical positioning.

Refer to figure 1.

- \* There are no adjustment of purity and convergence in some picture tube (Unified with purity magnet)

### COLOR PURITY ADJUSTMENT

NOTE : Before attempting any purity adjustments, the receiver should be operated for at least fifteen minutes.

1. Demagnetize the picture tube and cabinet using a degaussing coil.
2. Set the brightness and contrast to maximum.
3. Use a green raster from among the built-in test signals.
4. Loosen the clamp screw holding the yoke and slide the yoke backward or forward to provide vertical green belt (zone) in the picture screen.
5. Remove the Rubber Wedges.
6. Rotate and spread the tabs of the purity magnet (See figure 2.) around the neck of the picture tube until the green belt is in the center of the screen. At the same time, enter the raster vertically.
7. Slowly move the yoke forward or backward until a uniform green screen is obtained. Tighten the clamp screw of the yoke temporarily.
8. Check the purity of the red and blue raster.

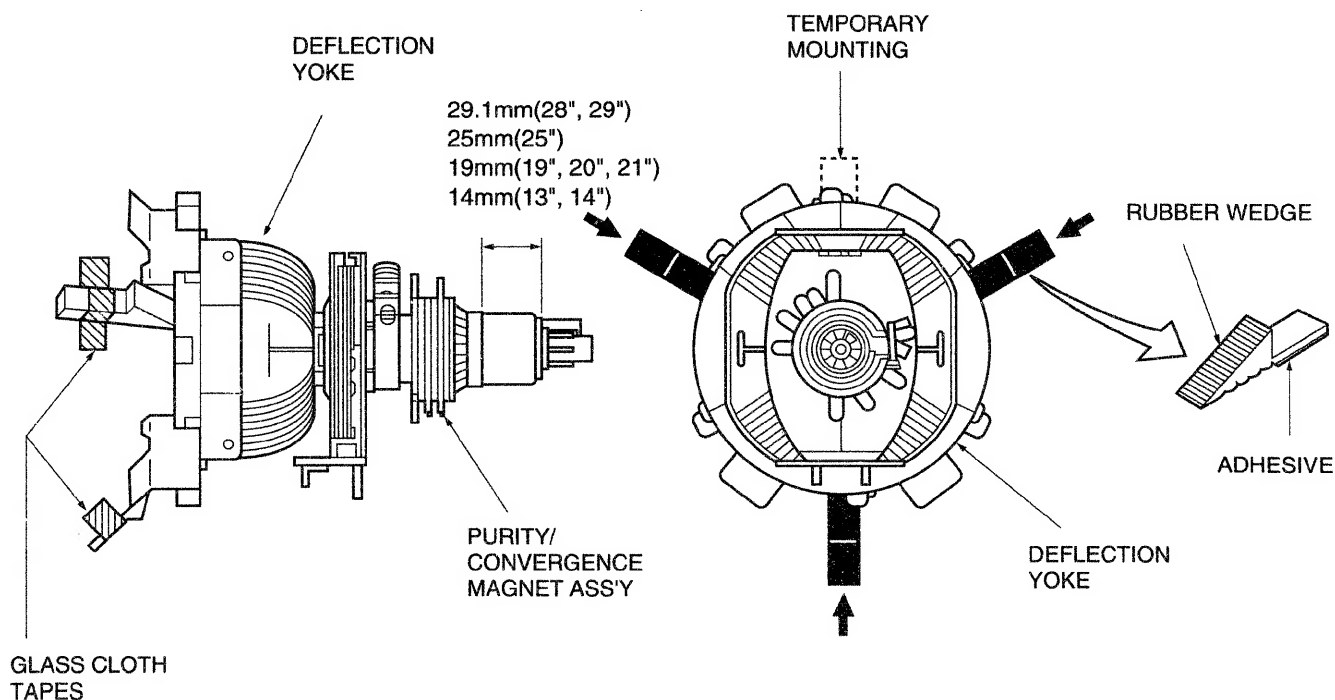


Figure 1.



## CONVERGENCE ADJUSTMENTS

**NOTE:** Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

### ■ CENTER CONVERGENCE ADJUSTMENT

1. Use the cross-dot pattern from among the built-in test signals.
2. Set the brightness and contrast for well defined pattern.
3. Adjust two tabs of the 4-Pole Magnets to change the angle between them (See figure 2.) and superimpose red and blue vertical lines in the center area of the picture screen.
4. Turn the both tabs at the same time keeping the angle constant to superimpose red and blue horizontal lines at the center of the screen.
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line and green one. Adjusting the angle affects the vertical lines and rotating both magnets affects the horizontal lines.
6. Repeat adjustments 3, 4, 5 keeping in mind red, green and blue movement, because 4-Pole Magnets and 6-Pole Magnets have mutual interaction and make dot movement complex.

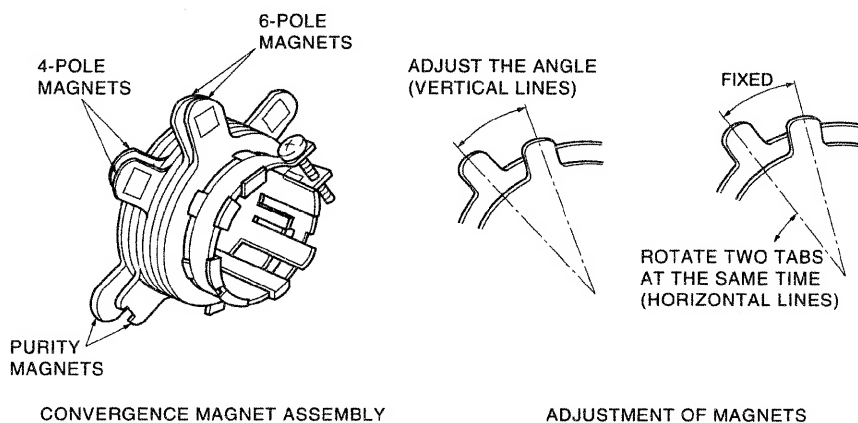
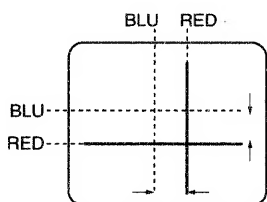
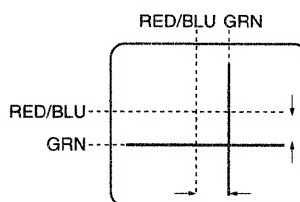


Figure 2.

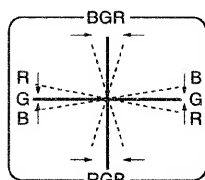


4-POLE MAGNETS MOVEMENT

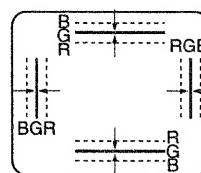


6-POLE MAGNETS MOVEMENT

Center Convergence by Convergence Magnets



INCLINE THE YOKE UP (OR DOWN)



INCLINE THE YOKE RIGHT (OR LEFT)

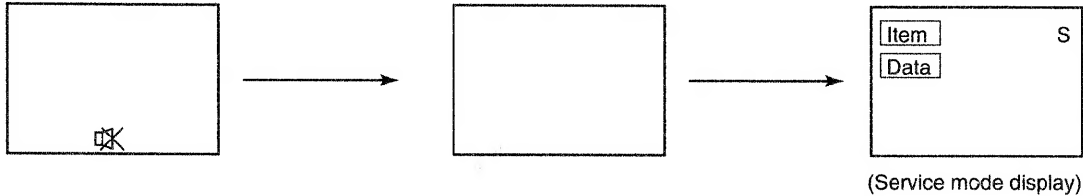
Circumference Convergence by DEF Yoke

Figure 3. Dot Movement Pattern

## SERVICE MODE

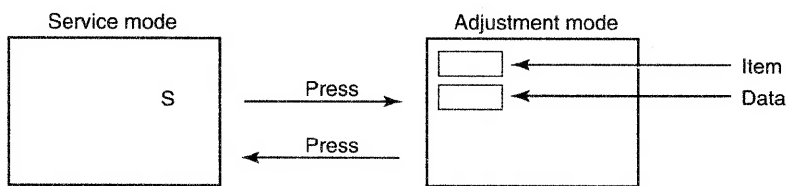
### 1. ENTERING TO SERVICE MODE

- 1) Press  $\text{⏏}$  button once on Remote Control.
- 2) Press  $\text{⏏}$  button again to keep pressing.
- 3) While pressing the  $\text{⏏}$  button, press MENU button on TV set.



### 2. DISPLAYING THE ADJUSTMENT MENU

- 1) Press MENU button on TV.



### 3. KEY FUNCTION IN THE SERVICE MODE

The following key entry during display of adjustment menu provides special functions.

A single horizontal line ON/OFF:	- / - - button (on Remote) or $\text{⊖}$ button (on TV)
Test signal selection :	$\text{⊖}$ button (on Remote)
Selection of the adjustment items :	Channel $\blacktriangle/\blacktriangledown$ (on TV or Remote)
Change of the data value :	Volume $\blacktriangle/\blacktriangledown$ +/- (on TV or Remote)
Adjustment menu mode ON/OFF :	MENU button (on TV)
Initialization of the memory (QA02) :	CALL + Channel button on TV ( $\blacktriangle$ )
Reset the count of operating protect circuit to "00":	CALL + Channel button on TV ( $\blacktriangledown$ )
"RCUT" selection :	1 button
"GCUT" selection :	2 button
"BCUT" selection :	3 button
"CNTX" (or "SCNT") selection :	4 button
"COLC" selection :	5 button - - - Color thickness correction
"TNTC" selection :	6 button
Test audio signal ON/OFF (1kHz) :	8 button
Self diagnostic display ON/OFF :	9 button

note: Displayed differently as shown below, depending on the setting of the receiving color system.

COLP (PAL)  
COLC (NTSC)  
COLS (SECAM)

**CAUTION :** Never try to perform initialization unless you have changed the memory IC.

#### 4. SELECTING THE ADJUSTING ITEMS

- 1) Every pressing of CHANNEL ▲ button in the service mode changes the adjustment items in the order of table-2. (▼ button for reverse order)

Refer to table-2 for preset data of adjustment mode.  
(See SETTING & ADJUSTING DATA on page 19)

#### 5. ADJUSTING THE DATA

- 1) Pressing of VOLUME ▲/– button will change the value of data in the range from 00H to FFH. The variable range depends on the adjusting item.

#### 6. EXIT FROM SERVICE MODE

- 1) Pressing POWER button to turn off the TV once.

#### ■ INITIALIZATION OF MEMORY DATA OF QA02

After replacing QA02, the following initialization is required.

1. Enter the service mode, then select any register item.
2. Press and hold the CALL button on the Remote, then press the CHANNEL ▲ button on the TV. The initialization of QA02 has been completed.
3. Check the picture carefully. If necessary, adjust any adjustment item above.

Perform "Auto search Memory" on the owner's manual.

CAUTION: Never attempt to initialize the data unless QA02 has been replaced.

#### 7. TEST SIGNAL SELECTION

- 1) Every pressing of –⊖ button on the Remote Control changes the built-in test patterns on screen as described below in SERVICE MODE.

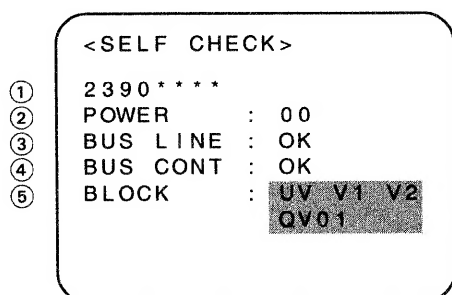
Signal off ———→ NTSC signals (14 patterns)  
 ←—— PAL signals (14 patterns) ←——

Signals	Picture
<ul style="list-style-type: none"> <li>• Red raster</li> <li>• Green raster</li> <li>• Blue raster</li> <li>• All Black</li> <li>• All White</li> </ul>	
<ul style="list-style-type: none"> <li>• Black &amp; White</li> </ul>	
<ul style="list-style-type: none"> <li>• Black cross-bar</li> <li>• White cross-bar</li> <li>• Black cross-bar on green raster</li> </ul>	
<ul style="list-style-type: none"> <li>• Black cross-hatch</li> <li>• White cross-hatch</li> </ul>	
<ul style="list-style-type: none"> <li>• Black cross-dot</li> <li>• White cross-dot</li> </ul>	
<ul style="list-style-type: none"> <li>• H signal (white)</li> <li>• H signal (black)</li> </ul>	

\* The signals marked with  are not usable to display in the Test signal for some model.

## 8. SELF DIAGNOSTIC FUNCTION

- 1) Press "9" button on Remote Control during display of adjustment menu in the service mode.  
The diagnosis will begin to check if interface among IC's are executed properly.
- 2) During diagnosis, the following displays are shown.



Indicated color of mode now selected : Green and Red  
Indicated color of other modes : White

Green : Normal

Red : The microcomputer operates to provide judgement of no video signal. The red color is still indicated though the signal is input, failure may exist in input signal line including QV01.

QV01 : In case of indication green ---Normal  
In case of indication red with input signal---  
Failure may exist in output line including QV01.

- ① Part number of microcomputer (QA01)
- ② Operation number of protecting circuit ----"00" is normal.  
When indication is other than "00", overcurrent apt to flow, and circuit parts may possibly be damaged.
- ③ BUS LINE CHECK ----"OK" is normal.  
"SDA1-GND" ----- SDA-GND short circuit.  
"SCL1-GND" ----- SCL-GND short circuit.  
"SCL1-SDA1" ----- SCL-SDA short circuit.
- ④ BUS CONT ----"OK" is normal.  
When indication shows "Q ○○○ NG", the device with the number may possibly be damaged.

### ⑤ BLOCK

UV : TV reception mode

V1 : VIDEO 1 input mode (⊖1)

V2 : VIDEO 2 input mode (⊖2)

**NOTE:** Component which controls character display on screen is QT01 (TELETEXT IC.). If this display function fails to operate due to damage in QT01, self diagnosis procedure is as follows.

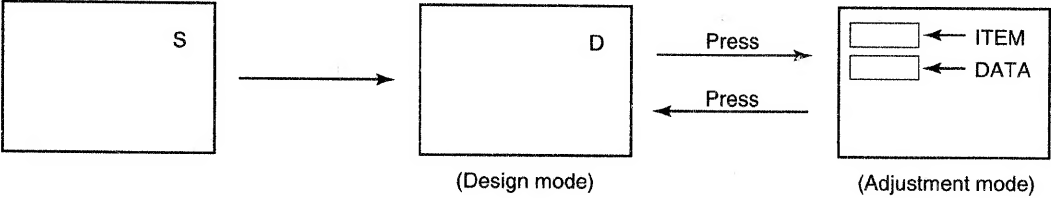
- (1) In case that power indicator is blinking with interval of 0.5 seconds, it means protecting circuit (Current limiter) is operating, and circuit components may possibly be damaged. Check related components.
- (2) In case that power indicator is blinking with interval of 1 second: Protecting circuit does not operate, but a part of Bus line does not operate normally. Check Bus line.

\* The items marked with ■ are not usable to display in the SELF DIAGNOSTIC FUNCTION for some model.

# DESIGN MODE

## 1. ENTERING TO DESIGN MODE

- 1) Select the Service mode.
- 2) While pressing CALL button on Remote and press MENU button on TV.
- 3) Press MENU button on TV.



When QA02 is initialized, items “OPT0” and “OPT1” of DESIGN MODE are set to the data of the representative model of this chassis family.  
 Therefore, because ON-SCREEN specification remains in the state of the representative of model. This model is required to reset the data of items “OPT0” and “OPT1”.

## 2. SELECTING THE ADJUSTING ITEMS

Every pressing of CHANNEL ▼ button in the design mode changes the adjustment items in the order of table-3.  
 (▲ button for reverse order)




Refer to table-3 for data of design mode.  
 (See SETTING & ADJUSTING DATA on page 20)

## 3. ADJUSTING THE DATA

Pressing of VOLUME ▲ or ▼ button will change the value of data.

## ELECTRICAL ADJUSTMENTS

ITEM	ADJUSTMENT PROCEDURE
FOCUS VR ADJ	<ol style="list-style-type: none"> <li>1. Enter the service mode, then select any register item.</li> <li>2. Press the TV/VIDEO button on the Remote until the black cross-bar pattern appears on the screen.</li> <li>3. Adjust the FOCUS control (on T461) for well defined scanning lines on the picture screen.</li> </ol>
SUB-BRIGHTNESS (BRTC)  Note: Constrict the picture height until the vertical retrace line appears adjusting the item HIT (HEIGHT).	<ol style="list-style-type: none"> <li>1. Set CONTRAST to minimum, and BRIGHTNESS to center by adjusting user controls.</li> <li>2. Set the TV in service mode to get white cross-bar of inside pattern.</li> <li>3. Select BRTC (brightness correction), and adjust the <math>\triangle</math> - /+ button to reduce the value so that white portion of inside pattern slightly light.</li> <li>4. Adjust <math>\triangle</math> - /+ button to increase the data value of BRTC, and set it just before the difference between the belt of vertical retrace and the border of black portion of inside pattern is visible. After that, return vertical height and contrast.</li> </ol> <div data-bbox="1086 607 1366 792" data-label="Image"> </div>
HORIZONTAL POSITION ADJUSTMENT (HPOS)  VERTICAL POSITION ADJUSTMENT (VPOS)	<ol style="list-style-type: none"> <li>1. Set the TV in service mode, and get black or white cross-bar signal with VIDEO button on remote hand unit.</li> <li>2. Select either HPOS (Horizontal picture phase) or VPOS (Vertical picture phase) with CHANNEL <math>\blacktriangle</math>, <math>\blacktriangledown</math> buttons, and adjust horizontal or vertical picture position in the center of screen with VOLUME <math>\triangle</math> - /+ buttons.</li> </ol> <div data-bbox="1023 987 1430 1285" data-label="Image"> </div>
VERTICAL AMPLITUDE ADJUSTMENT (HIT)	<ol style="list-style-type: none"> <li>1. Set the TV in service mode, and get black or white cross-hatch signal with VIDEO button on remote hand unit.</li> <li>2. Select HIT (Vertical amplitude) with CHANNEL <math>\blacktriangle</math>, <math>\blacktriangledown</math> buttons, and adjust vertical amplitude with VOLUME <math>\triangle</math> - /+ buttons so that vertical amplitude lacks a little.</li> <li>3. Adjust vertical amplitude with VOLUME <math>\triangle</math> - /+ buttons so that the first bar on cross-hatch signal touches edge of screen.</li> </ol> <div data-bbox="999 1364 1422 1666" data-label="Image"> </div>

ITEM	ADJUSTMENT PROCEDURE
<p>WHITE BALANCE ADJUSTMENT</p> <ul style="list-style-type: none"> <li>● CUTOFF ADJUSTMENT (RCUT) (GCUT) (BCUT)</li> <li>● DRIVE ADJUSTMENT (GDRV) (BDRV)</li> </ul>	<ol style="list-style-type: none"> <li>1. Set Contrast to 40, and brightness to +20 by picture control.</li> <li>2. Set the TV in service mode, and get the inside W/B adjusting signal with VIDEO button.</li> <li>3. Select RCUT, GCUT and BCUT with CHANNEL ▲, ▼ buttons, to set individual values to Initial reference data, and to set GDRV and BDRV to Initial reference data with VOLUME ▲ – /+ buttons (See page 19).</li> <li>4. Press  button on the remote control and rotate Screen VR to get one slight horizontal line on screen. Note: Every pressing of  button provides Horizontal line picture and Normal picture alternately.</li> <li>5. Press  button to release horizontal line picture, and select the two other colors which did not light in the above step with CHANNEL ▲, ▼ buttons. Then tap VOLUME ▲ – /+ buttons so that three colors slightly light in the same level.</li> </ol> <p>※ To correct white balance in light area, select GDRV and BDRV with CHANNEL ▲, ▼ buttons to adjust.</p> <p>※ To correct white balance in dark area, perform fine adjustment of RCUT, GCUT and BCUT.</p> <div data-bbox="951 645 1356 943" style="border: 1px solid black; border-radius: 10px; padding: 10px; margin-top: 20px;"> <div data-bbox="1021 651 1289 730" style="border: 1px solid black; padding: 5px; text-align: center;">Light area check (to show white)</div> <div data-bbox="1021 869 1289 943" style="border: 1px solid black; padding: 5px; text-align: center;">Dark area check (to show black)</div> </div>

MODEL: S7ES Series (Reference factory adjustments)

## 1. SUB CONTRAST

(Measuring point) Q501 #14 R-OUT  
 (Adjusting signal) Sub Bright (NTSC) signal  
 (Adjusting method)

## 1. BUS data of Q501

RCUT	(Q501 SUB ADDR:0C)	→ Initial value	(20H)
Y <sub>γ</sub>	(Q501 SUB ADDR:08/D7)	→ OFF	(0)
WPL	(Q501 SUB ADDR:08/D6)	→ OFF	(1)
PACL	(Q501 SUB ADDR:08/D5)	→ OFF	(0)
COLOR	(Q501 SUB ADDR:02/D7-D0)	→ MIN	(00H)

2. Set user control to the standard 1

3. Change to adjust SCNT data (Q501 SUB ADDR:05/D4~D0).

※ It makes the point which doesn't have a change and it adjust with screen VR.

4. After adjustment, return the data which are set in steps 1, 2 above, to original data.

SPEC  $2.5 \pm 0.2$  V p-p

## 2. SUB COLOR PAL (THIS ADJUSTMENT AFTER SUB COLOR NTSC)

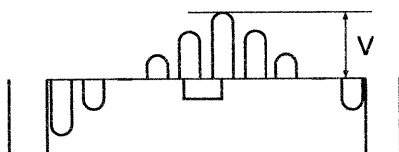
(Measuring point) Q501 #12 B-OUT  
 (Adjusting signal) Sub Bright (PAL) signal  
 (Adjusting method)

1. Set BUS data of Q501 to the same value as that of SUB TINT adjustment.

2. Set user control to the standard 1.

3. Change COLP data (COLC Difference data) to adjust the 6th peak ampl of rainbow color bar.

Adjust the amplitude of color bar  
 (p-p value of the upper half)

 $1.4 \pm 0.2$  V p-p

4. After adjustment return the data set in steps 1,2 above, to the original data.



## 3. SUB COLOR SECAM (THIS ADJUSTMENT AFTER SUB COLOR NTSC)

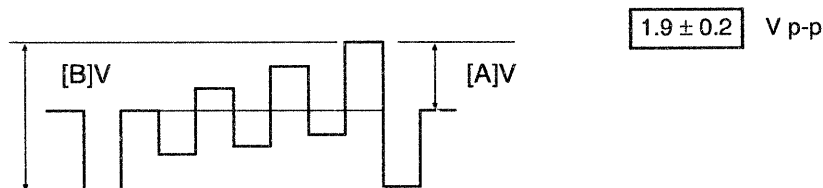
(Measuring point) Q501 #12 B-OUT

(Adjusting signal) SECAM color bar signal

(Adjusting method)

1. Set BUS data of Q501 to the same value as that of SUB TINT adjustment.
2. Set user control to the standard 1.
3. Change COLS data (COLC Difference data) to adjust the 6th peak amplitude of SECAM color bar.

Adjust the amplitude of color bar.



4. After adjustment, return the data set in steps 1, 2 above, to the original data.

## 4. SUB TINT

(Measuring point) Q501 #12 B-OUT

(Adjusting signal) Sub Bright (NTSC) signal

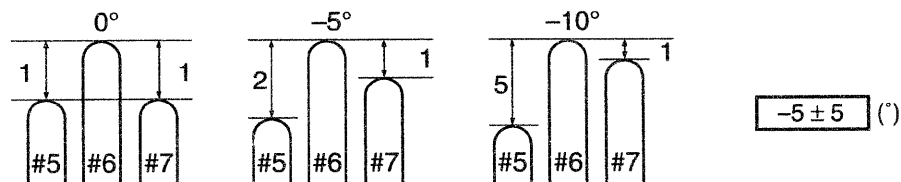
(Adjusting method)

## 1. BUS data of Q501

BDRV	(Q501 SUB ADDR:0A)	→ Initial value	(80H)
BCUT	(Q501 SUB ADDR:0E)	→ Initial value	(20H)
COLOR LIMITER	(Q501 SUB ADDR:0F/D2)	→ OFF	(0)
MUTE	(Q501 SUB ADDR:1B/D7~D6)	→ Y mute	(10)
P/N CD ATT	(Q501 SUB ADDR:12/D5~D4)	→ 0dB	(01)
S-field	(Q501 SUB ADDR:1F/D7)	→ OFF	(0)
SCD ATT	(Q501 SUB ADDR:1F/D6)	→ 0dB	(0)
P-ACL	(Q501 SUB ADDR:18/D5)	→ OFF	(0)

## 2. Set user control to the standard 1

3. Change to adjust TINTC data (Q501 SUB ADDR:03/D6D0) so that difference between 6th peak and 5th and 7th peaks of rainbow color bar becomes 2:1.



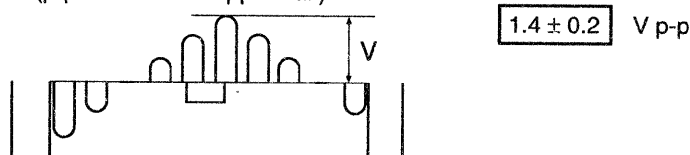
4. After adjustment, return the data which are set in steps 1, 2 above, to original data.

## 5. SUB COLOR NTSC

(Measuring point) Q501 #12 B-OUT  
 (Adjusting signal) Sub Bright (NTSC) signal  
 (Adjusting method)

1. Set BUS data of Q501 to the same value as that of Sub TINT adjustment.
2. Set user control setting to the standard 1
3. Change COLC data (Q501 SUB ADDR:02/D7~D0) to adjust the 6th peak amplitude of rainbow color bar.

Adjust the amplitude of color bar.  
 (p-p value of the upper half)



4. After adjustment, return the data set in steps 1 and 2 above, to the original.

## 6. SUB BRIGHT

(Adjusting signal) SUB Bright (PAL or NTSC) signal  
 (Adjusting method)

1. Set user control setting to the standard 1.
2. Change BRTC data (Q501 SUB ADDR:01/D7D0) to set black collapse numbers by eye check.

SPEC  $4 \pm 1.5$  V p-p

## 7. WHITE BALANCE ADJUSTMENT

(Adjusting method)

1. Set user control setting to the standard 1.
2. BUS data of Q501
 

GDRV	(Q501 SUB ADDR:09)	→ Initial value	(80H)
BDRV	(Q501 SUB ADDR:0A)	→ Initial value	(80H)
RCUT	(Q501 SUB ADDR:0C)	→ Initial value	(20H)
GCUT	(Q501 SUB ADDR:0D)	→ Initial value	(20H)
BCUT	(Q501 SUB ADDR:0E)	→ Initial value	(20H)
3. Set the mode to the one horizontal line mode
 

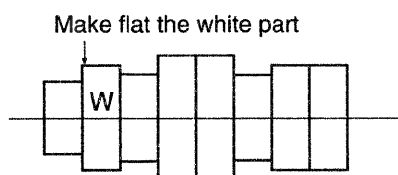
MUTE	(Q501 SUB ADDR:1B/D7~D6)	→ H. Line	(11)
BRIGHT	(Q501 SUB ADDR:01)	→ Initial value	(80H)
4. Change SCREEN VR to set it so that one of lines R, G and B will light slightly.
5. Change CUTOFF data to adjust so that each one of R, G and B will light slightly (for about white).
6. Release the H. Line mode.
7. Change B/G drive data and R/G/B CUTOFF data to adjust white balance in bright area and dark area.

## 8. SECAM BELL FILTER ADJUSTMENT

(Measuring point) Q501 #36 B-Y OUT  
 (Adjusting signal) Color bar (SECAM) signal  
 (Adjusting method)

1. Connect resistor 1k ohm between color limiter terminal (Q501 #26) and 5V.
2. Connect resistor 100 ohm between Q501 #35 and 5V.
3. Set COLOR control data to "04H".
4. Set MICOM YS output to "H", and set Q501 to DIGITAL RGB mode.
5. Change BELL data (Q501 SUB ADDR:ifD1D0) to set it so that SECAM signal at #36 pin of Q501 (B-Y OUT) can be flat.
6. After adjustment, remove resistor 1k ohm between color limiter terminal (Q501 #26) and 5V, and remove resistor 100 ohm between Q501 #35 and 5V, to return COLOUR control data to original.

SPEC  $100 \pm 10$  %

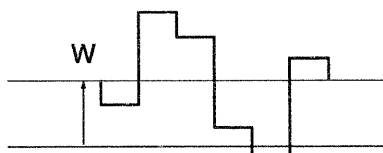


## 9. SECAM OFFSET ADJUSTMENT

(Measuring point) Q501 #35 R-Y OUT  
 #36 B-Y OUT  
 (Adjusting signal) Color bar (SECAM) signal  
 (Adjusting method)

1. Change SRY data (Q501 SUB ADDR:11/D7~D4) to coincide level of black and white part in color differential signal (R-Y) to the level of H. BLK part.

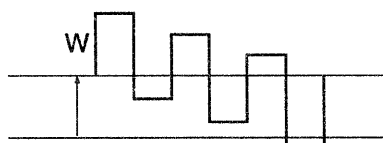
Match the level of black and white signal part in color differential signal to that of H.BLK.  
 (center of noise signal)



SPEC B-Y/R-Y  $0 \pm 10$  mV p-p

2. Change SBY data (Q501 SUB ADDR:11/D3~D0) to coincide level of black and white part in color differential signal (B-Y) to the level of H. BLK part.

Match the level of black and white signal part in color differential signal to that of H.BLK.  
 (center of noise signal)



SPEC B-Y/R-Y  $0 \pm 10$  mV p-p

## 10. CHROMA TRAP ADJUSTMENT → NO ADJUSTMENT

## 11. Item, [VERT POSITION]

SETTING, CONTRAST=MAX. BRIGHT=CENTER COLOR=CENTER

Input signal, WG Philips Pattern (Do not use French SECAM).

Measurement place, On Picture

Adjustment method, Adjust [VPOS] upper and lower position in Philips pattern may become a center. (Turn the direction of CPT to the south or the north when adjusting. Adjust the amount offsetting if it is not possible to do.)

## 12. Item, [V-HEIGHT]

SETTING, CONTRAST=MAX. BRIGHT=CENTER COLOR=CENTER

Input signal, WG Philips Pattern (Do not use French SECAM).

Measurement place, On Picture

Adjustment method, Adjust the sub address [HIT] of Philips pattern may hide frag of the upper and lower sides in exactly.

## 13. Item, [HORIZONTAL POSITION]

SETTING, CONTRAST=MAX. BRIGHT=CENTER COLOR=CENTER

Input signal, WG Philips Pattern (Do not use French SECAM).

Measurement place, On Picture

Adjustment method, Adjust the sub address [HPOS] of Philips pattern to center.  
(Minimize D-C in the adjustment magnetic field on CRT.)

## 14. Item, [HORIZONTAL WIDTH][SIDE PINCUSHION][TRAPEZOID DISTORTION]

SETTING, CONTRAST=MAX. BRIGHT=CENTER COLOR=CENTER

After V-HEIGHT/V-POSITION adjustment.

Input signal, WG Philips Pattern (Do not use French SECAM).

Measurement place, On Picture

Adjustment method, Adjust Sub-address [WID] to just hide the flag that Philips Pattern is right and left and is white. Adjust Sub-address [PARA] and adjust the line of setting up in changeable right and left to the straight line. Move Sub-address [TRAP] and correct a trapezoid distortion. Again, adjust Sub-address [WID]. (Turn the direction of CPT to the east or the west when adjusting. Adjust the amount offsetting if it is not possible to do.)

15. V901 ADJUSTMENT  
 (Point) C.CRT adjusting magnetic field  
 (Adjusting magnetic field)

Correction field		Adjusting	Confirming
		perpendicular field	perpendicular field
Mid Near East	North field	35 $\mu$ T	35 $\mu$ T
Russian	North field	35 $\mu$ T	35 $\mu$ T
Asia, Hongkong	Zero field	0 $\mu$ T	0 $\mu$ T
New Zealand, Australia	South field	-50 $\mu$ T	-50 $\mu$ T

Adjusting procedure is based on working instruction of CPT Adjustment.

## CIRCUIT CHECK

### HIGH VOLTAGE CHECK

**CAUTION:** There is no HIGH VOLTAGE ADJUSTMENT on this chassis. Checking should be done following the steps below.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage must be measured below ⑥ kV.

Refer to table-1 for high voltage ⑥.  
(See SETTING & ADJUSTING DATA on page 19)

4. Vary the BRIGHTNESS control to both extremes to be sure the high voltage does not exceed the limit under any conditions.

## CHAPTER 2 SPECIFIC INFORMATION

### SETTING & ADJUSTING DATA

#### 【 SAFETY INSTRUCTIONS 】

		29"
HIGH VOLTAGE AT ZERO BEAM:	Ⓐ	31.3 kV
MAX HIGH VOLTAGE:	Ⓑ	33.0 kV
AV VOLTAGE	Ⓒ	110~240 V

Table-1

#### 【 SERVICE MODE 】

##### ADJUSTING ITEMS AND DATAS IN THE SERVICE MODE:

Item	Adjustment	Reference data
RCUT	R CUTOFF (B/W)	20H
GCUT	G CUTOFF (B/W)	20H
BCUT	B CUTOFF (B/W)	20H
GDRV	G DRIVE	80H
BDRV	B DRIVE	80H
BRTC	SUB BRIGHT CEN	80H
COLC	SUB COLOR CEN NTSC	80H
TNTC	SUB TINT CEN	40H
COLP	SUB COLOR CEN PAL	00H
COLS	SUB COLOR CEN SECAM	00H
SCNT	SUB CONTRAST	0AH
HPOS	50Hz H-POSITION	09H
VPOS	V-POSITION	03H
HIT	HEIGHT	40H
VLIN	V-LINEARITY	0AH
WID	PICTURE WIDTH	0FH
PARA	E-W PARABOLA	27H
TRAP	TRAPEZIUM	10H
BELL	SECAM BELL FILTER	01H
SRY	SECAM R-Y	08H
SBY	SECAM-B-Y	08H

Table-2

**【 DESIGN MODE 】****ADJUSTING ITEMS AND DATAS IN THE DESIGN MODE:**

Item	Name of adjustment		Data	Remarks
		Preset Data		
* There are no adjustment mode in the DESIGN MODE.				

**Table-3**

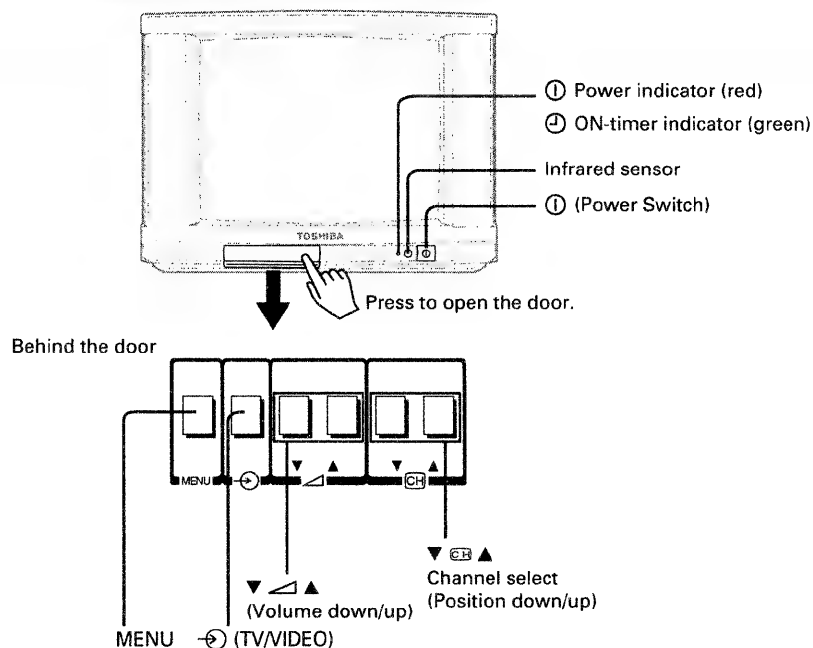


# LOCATION OF CONTROLS

## (TV SET) (Representative Model: 2975SH)

- The following describes the name of each part of the TV and Remote Controller.

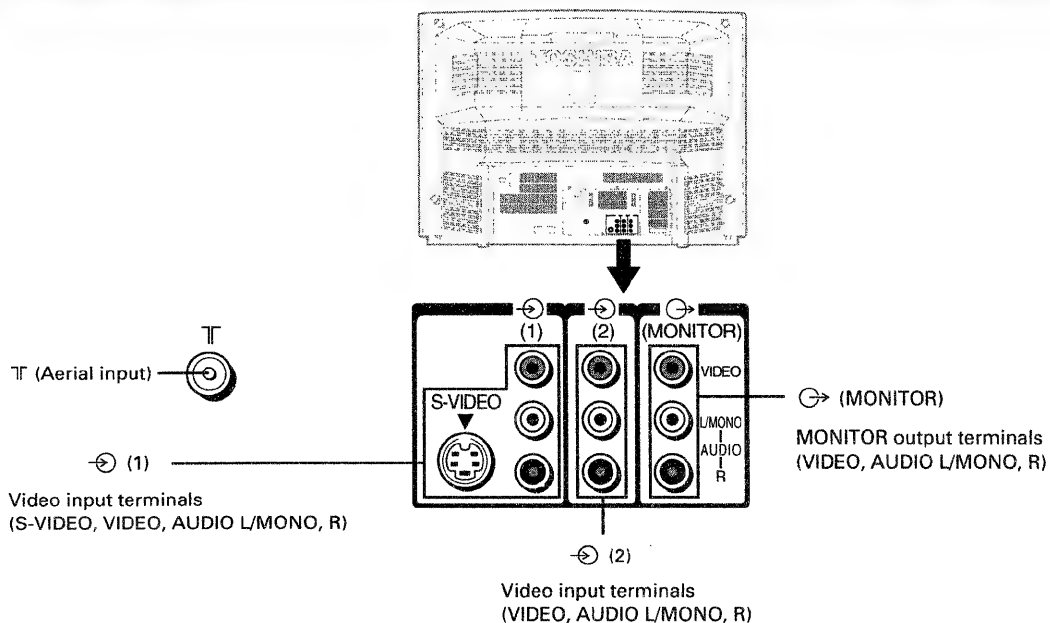
### Front



#### Notes

- Functions of MENU, (TV/VIDEO), (Volume down/up), and Channel select (Position down/up) are also provided to the Remote Controller.
- When the TV set is in the standby mode, and the Remote Controller is not at your hand, you can turn on the set by pressing the (TV/VIDEO), (Volume down/up), or Channel select (Position down/up) button.

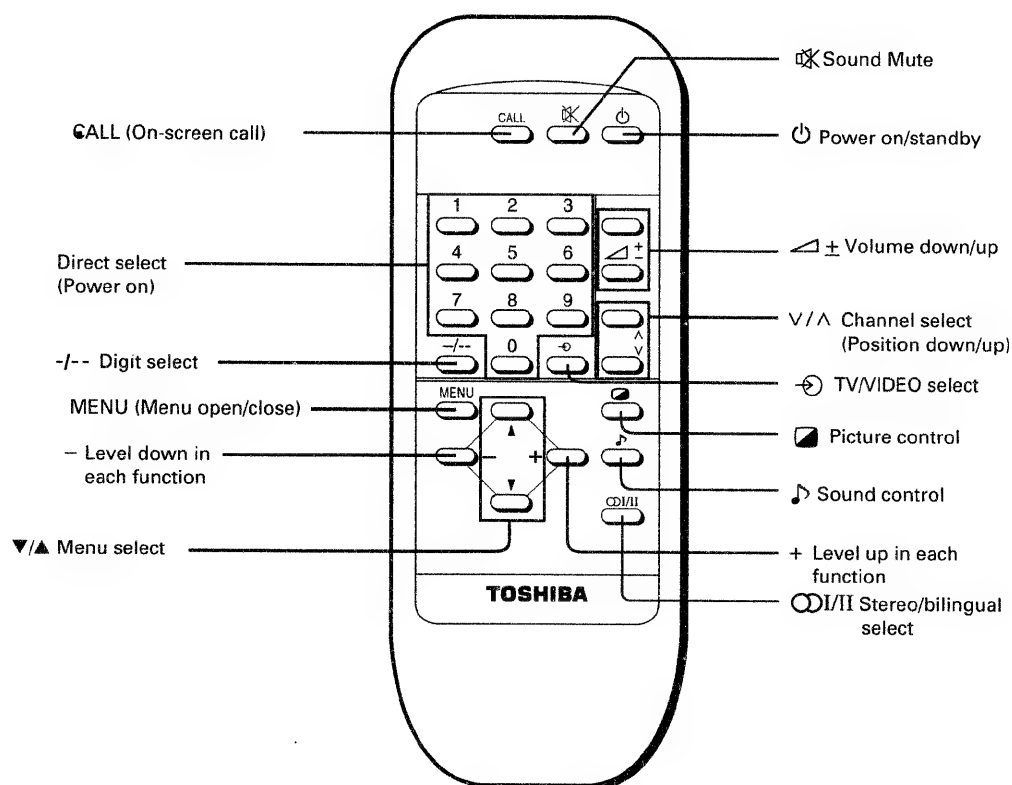
### Back



# LOCATION OF CONTROLS (REMOTE)

- The following describes the name of each part of the TV and Remote Controller.

## Remote Controller

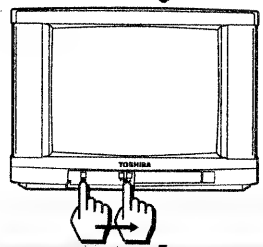
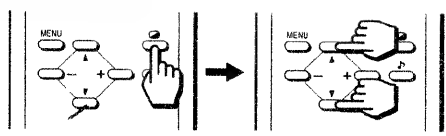






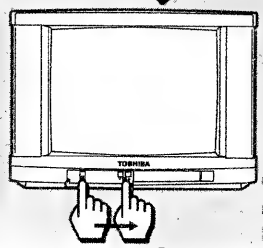
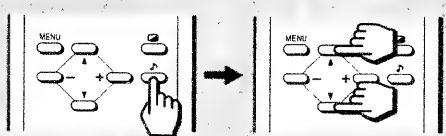




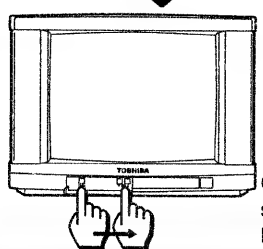
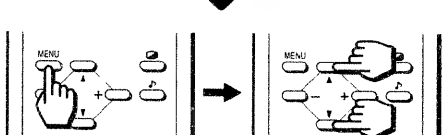

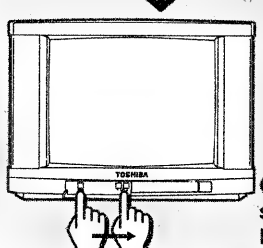
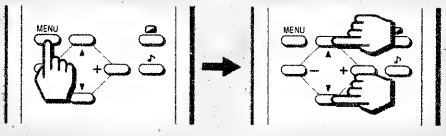
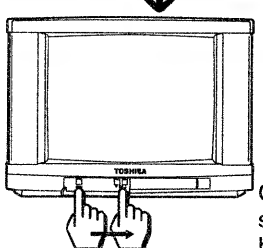
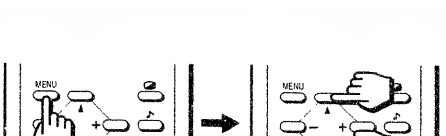


### Note:


You can turn on the set also by pressing one of the direct select buttons (0 – 9) instead of the button. By pressing the number (one digit only) where the channel, you want to watch is preset, you can turn on the set and channel selection at the sametime.

# MENU FUNCTION

- Before watching the TV, please familiarize yourself the method to use the menu function of this TV set.
- The owner's manual shows the explanation for operations mainly using the Remote Controller. But you can perform the operations using the buttons on the TV set as well.

TV Set	Remote Controller	Menu Display
 <p>Channel select buttons</p>		<div>PICTURE</div> <div>▶  CONTRAST</div> <div>▶  BRIGHTNESS</div> <div>▶  COLOR</div> <div>▶  TINT</div> <div>▶  SHARPNESS</div> <div>▶  B/B ON</div>
 <p>Channel select buttons</p>		<div>SOUND</div> <div>▶  THEATER</div> <div>▶  BASS</div> <div>▶  TREBLE</div> <div>▶  BALANCE</div>
 <p>Channel select buttons</p>		<div>FUNCTION</div> <div>▶  TIMER</div> <div>OFF 00:00</div> <div>ON 00:00 P01</div>
 <p>Channel select buttons</p>		<div>LANGUAGE</div> <div>ENGLISH</div> <div>中文</div> <div>MELAYU</div>
 <p>Channel select buttons</p>		<div>SET UP</div> <div>▶ COLOR AUTO</div> <div>SOUND BG</div> <div>ASM [+]</div> <div>&gt;&gt;&gt; [-] [+]</div> <div>POSITION P00</div> <div>SKIP [+]</div> <div>OFF</div>
		<div>SET UP</div> <div>▶ MFT [-] [+]</div> <div>AFT ON</div>

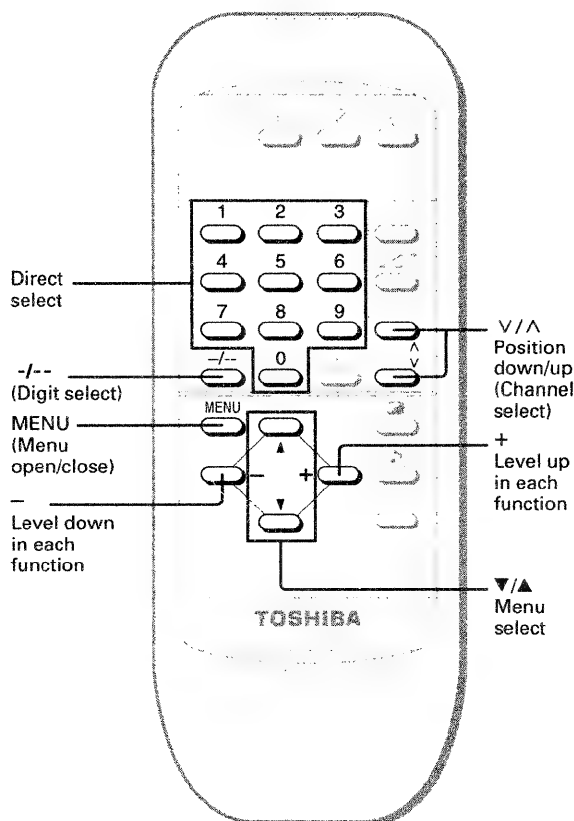
## Notes

- To adjust or select (OFF/ON, etc) for each item, use the -/+ buttons.
- The  area on the SET UP menu display does not appear in the video mode.

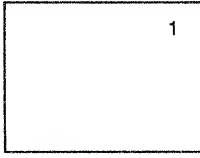
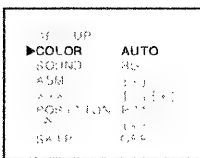
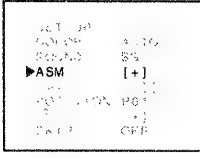
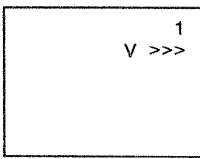
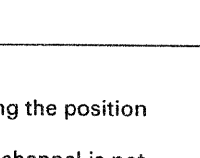
# PROGRAMMING CHANNEL MEMORY

- First, use the ASM (Automatic Search Memory) function to preset all active channels in your area automatically. Then, arrange the preset channels with the SEARCH (>>>), SKIP, MFT (Manual Fine Tuning) and AFT (Auto Fine Tuning) functions so that you can tune into only desired channels.
- This section shows how to tune in channels using mainly the Remote Controller. You can also perform the system select, ASM, SEARCH (>>>), SKIP, MFT and AFT operations using the buttons on the TV set.

## To preset channels (ASM)



### ASM (Automatic Search Memory)

- Select the head of the position number to start the ASM with the position down (▼)/up (▲) buttons or the digit/direct select buttons.
 
- Press the MENU button repeatedly to call up the SET UP menu on the screen.
 
- Confirm that "COLOR" is set to "AUTO" and "SOUND" is set to proper system. If not, press the ▼/▲ buttons to move the cursor (▶) to "COLOR" or "SOUND" and press the -/+ buttons to select each proper system.
 
- Press the ▼/▲ buttons to move the cursor (▶) to "ASM".
 
- Press the "+" button to start the ASM. All active channels will be preset automatically. When presetting is complete, the initial position number will reappear.
 

### After presetting

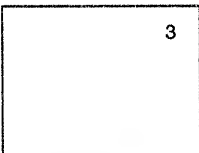
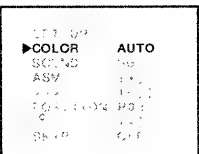
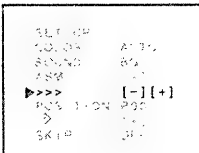
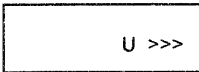
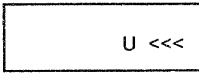
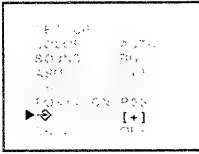
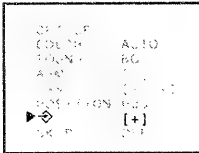
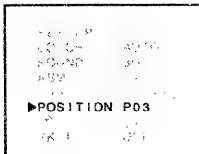
Check the preset channels by pressing the position down (▼)/up (▲) buttons.

- If the picture or sound of a certain channel is not good, fine-tune the channel using the MFT function.
- If the colour of a certain channel is abnormal, automatic colour system selection (AUTO) may malfunction, or sound system selection is wrong. In such a case, select another colour and/or sound system.

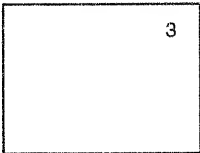
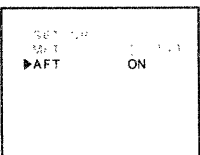
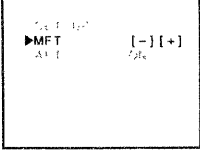
- Use the SEARCH function if desired channels cannot be preset with the ASM or if you would like to preset the desired channels to specific position numbers one by one.
- The adjustments below are not necessary under normal conditions. However, in areas of inferior broadcast conditions where adjustment is necessary for a better picture, adjust the tuning with the MFT (Manual Fine Tuning). The AFT OFF status automatically keeps the condition adjusted with the MFT function.
- The AFT (Auto Fine Tuning) function automatically corrects slight fluctuations when receiving signals.
- When using Manual Search to preset the channel, the AFT will automatically turn ON and SKIP to OFF.

## To preset channels (Manual search, AFT, MFT)

### Manual search (>>>)

- 1 Select a position number with the position down (v)/up (^) or digit/direct select buttons.  

- 2 Press the MENU button repeatedly to call up the SET UP menu on the screen.  

- 3 Press the ▼/▲ buttons to move the cursor (►) to ">>>".  

- 4 Press the -/+ buttons to start searching. The - button searches for lower-numbered channels; the + button for higher-numbered channels. Repeat this process until you can get the desired channel.  
Ex. search up  
  
Ex. search down  

- 5 When the desired programme is shown, press the ▼/▲ buttons to move the cursor (►) to "◆".  

- 6 Press the + button to memorize the channel at the current position.  

- 7 When you desire to store another channel at another position, move the cursor (►) to "POSITION" with the ▼/▲ buttons and select a desired position with the -/+ buttons. Then, press the ▼/▲ buttons to move the cursor (►) to ">>>" and repeat the steps 4 to 7.  


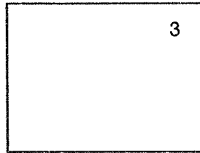
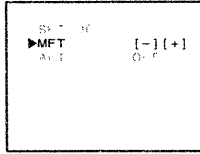
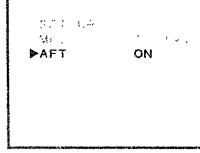
### MFT (Manual Fine Tuning)

- 1 Select the position number you want to fine-tune with the position down (v)/up (^) buttons or digit/direct select buttons.  

- 2 Press the MENU button repeatedly to call up the SET UP menu on the screen.  

- 3 Press the ▼/▲ buttons to move the cursor (►) to "MFT".  

- 4 Press the -/+ buttons until the best possible picture and sound are obtained.

#### Note

When operating the MFT function, the AFT status is automatically set to OFF.

### AFT (Auto Fine Tuning)

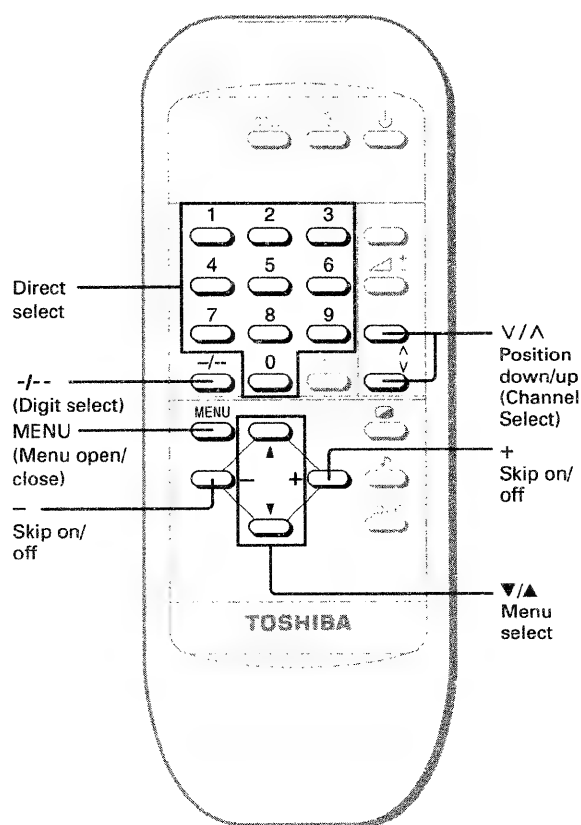
- 1 Select the position number you want to fine-tune with the position down (v)/up (^) buttons or digit/direct select buttons.  

- 2 Press the MENU button repeatedly to call up the SET UP menu on the screen.  

- 3 Press the ▼/▲ buttons to move the cursor (►) to "AFT". Press the -/+ buttons to select the "ON" indication.  


#### Note

When the position is set to AFT OFF status, the "■" mark appears to the left of the position number. When the channel is set to AFT ON status, the position number is displayed without the "■" mark.

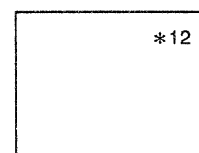
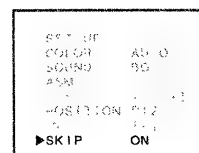
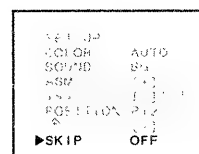
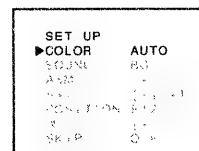
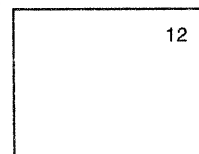
## To skip unnecessary position numbers

After presetting the channels, you may skip unnecessary position numbers so that only the channels you want to watch are selected.



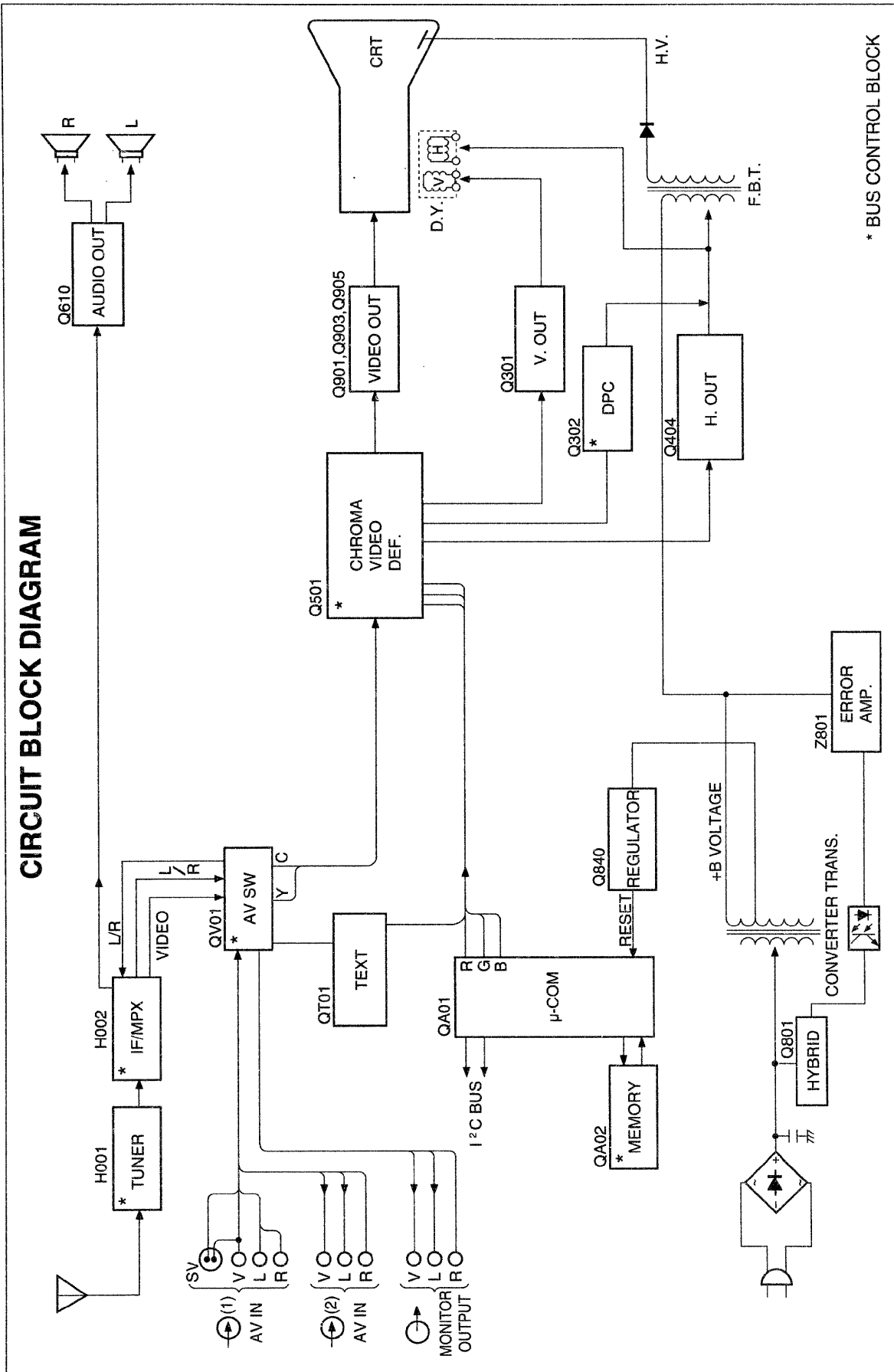
### To skip a position number

- 1 Select the position number to be skipped with the position down (V)/up (Δ) buttons or digit/direct select buttons.
- 2 Press the MENU button repeatedly to call up the SET UP menu on the screen.
- 3 Press the ▼/▲ buttons to move the cursor (►) to "SKIP".
- 4 Press the -/+ buttons to select "SKIP ON".
- 5 Press the MENU button to turn off the SET UP menu display. Select the position number to be skipped with the direct select buttons. The \* mark appears to the left of the position number. The position number will then be skipped when you select the position with the position down (V)/up (Δ) buttons.

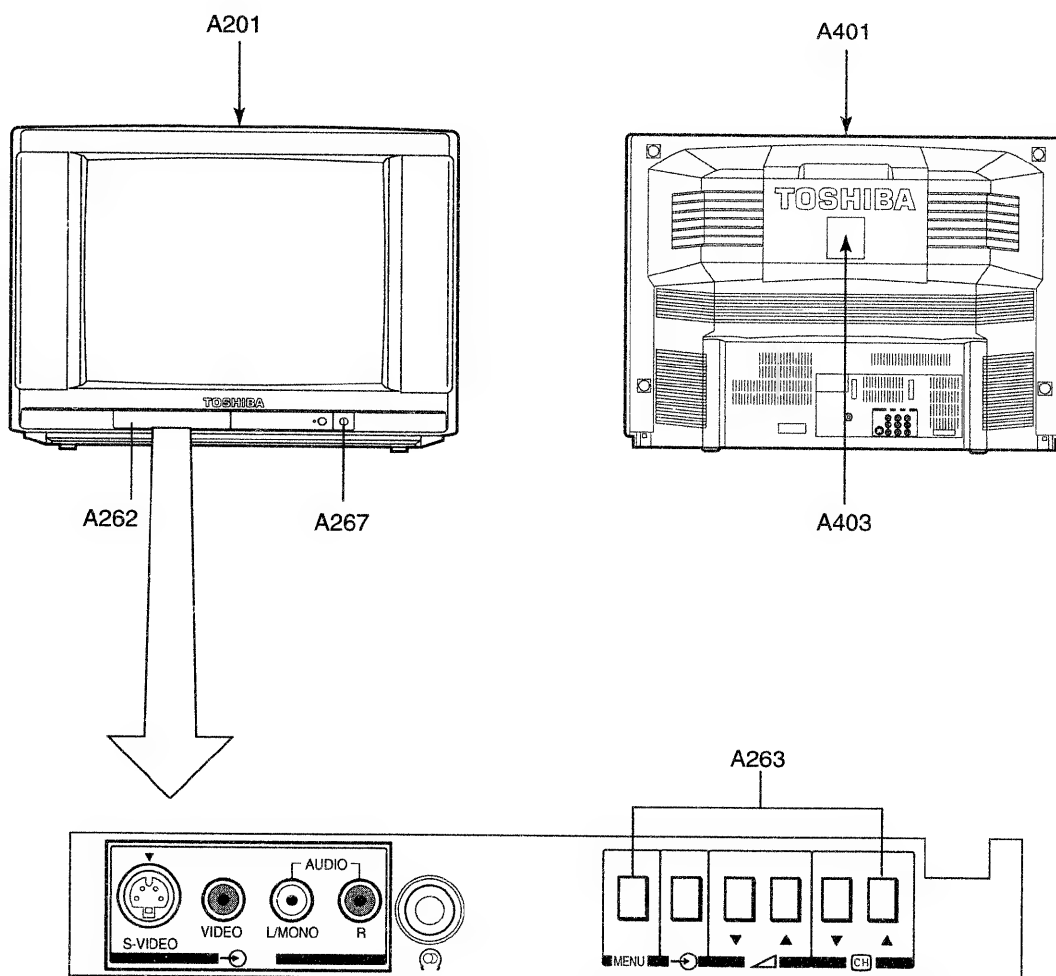


### To restore a skipped position number

- 1 Select the position number you want to restore with the direct select (and/or digit select) buttons.
- 2 Press the MENU button to call up the SET UP menu display and press the ▼/▲ buttons to move the cursor (►) to "SKIP".
- 3 Press the -/+ buttons to select "SKIP OFF".



## CABINET REPLACEMENT PARTS LIST



Location No.	Part No.	Description
A201	23510349	Front Cover (2975DE)
A201	23510350	Front Cover (2975SH)
A262	23421842	Door, Proper (2975DE)
A262	23421843	Door, Proper (2975SH)
A263	23444877	Key, Control
A267	23444866	Knob, Power
A272	23436554	Handle
△A401	23426726	Back Cover
A403	23560783	Label, Model No. 2975DE
A403	23560784	Label, Model No. 2975SH



## CHASSIS REPLACEMENT PARTS LIST

**WARNING:** BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 3 OF THIS MANUAL.

**CAUTION:** The international hazard symbols " $\triangle$ " in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE. Do not degrade the safety of the receiver through improper servicing.

**NOTICE:**

- The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.
- The PC board assembly with \* mark is no longer available after the end of the production.

**Model : 2975DE, 2975SH**

Capacitors .....	CD : Ceramic Disk	PF : Plastic Film	EL : Electrolytic
Resistors .....	CF : Carbon Film	CC : Carbon Composition	MF : Metal Film
	OMF : Oxide Metal Film	VR : Variable Resistor	FR : Fusible Resistor

(All CD and PF capacitors are  $\pm 5\%$ , 50V and all resistors,  $\pm 5\%$ , 1/6W unless otherwise noted.)

Location No.	Part No.	Description
<b>CAPACITORS</b>		
C101	24796479	EL, 4.7 $\mu$ F, $\pm 20\%$ , 35V
C102	24436221	CD, 220pF
C103	24794221	EL, 220 $\mu$ F, $\pm 20\%$ , 16V
C104	24567104	PF, 0.1 $\mu$ F
C105	24212102	CD, 1000pF, $\pm 10\%$
C106	24206010	EL, 1 $\mu$ F, 50V
C107	24567104	PF, 0.1 $\mu$ F
C109	24567104	PF, 0.1 $\mu$ F
C111	24669229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V
C112	24669229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V
C120	24797478	EL, 0.47 $\mu$ F, $\pm 20\%$ , 50V
C121	24797478	EL, 0.47 $\mu$ F, $\pm 20\%$ , 50V
C123	24794221	EL, 220 $\mu$ F, $\pm 20\%$ , 16V
C199	24232103	CD, 0.01 $\mu$ F, $+80\%$ , $-20\%$
C210	24538104	PF, 0.1 $\mu$ F
C212	24590104	PF, 0.1 $\mu$ F
C213	24797220	EL, 22 $\mu$ F, $\pm 20\%$ , 50V
C214	24212103	CD, 0.01 $\mu$ F, $\pm 10\%$
C215	24794470	EL, 47 $\mu$ F, $\pm 20\%$ , 16V
C216	24797010	EL, 1 $\mu$ F, $\pm 20\%$ , 50V
C217	24797479	EL, 4.7 $\mu$ F, $\pm 20\%$ , 50V
C218	24590104	PF, 0.1 $\mu$ F
C220	24567104	PF, 0.1 $\mu$ F
C221	24567104	PF, 0.1 $\mu$ F
C222	24567104	PF, 0.1 $\mu$ F
C304	24214471	CD, 470pF, $\pm 10\%$ , 500V
C305	24617912	EL, 2.2 $\mu$ F, $\pm 10\%$ , 50V
C306	24073059	EL, 3300 $\mu$ F, $\pm 20\%$ , 25V
C307	24693473	PF, 0.047 $\mu$ F, 100V
C308	24668221	EL, 220 $\mu$ F, $\pm 20\%$ , 35V
C310	24073072	EL, 1000 $\mu$ F, $\pm 20\%$ , 35V
C311	24214561	CD, 560pF, $\pm 10\%$ , 500V
C313	24082057	PF, 0.22 $\mu$ F, 100V
C314	24590563	PF, 0.056 $\mu$ F
C315	24797010	EL, 1 $\mu$ F, $\pm 20\%$ , 50V
C315	24590102	PF, 1000pF
C318	24666101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
C319	24212102	CD, 1000pF, $\pm 10\%$
C320	24668101	EL, 100 $\mu$ F, $\pm 20\%$ , 35V
C322	24617912	EL, 2.2 $\mu$ F, $\pm 10\%$ , 50V

Location No.	Part No.	Description
C323	24567154	PF, 0.15 $\mu$ F
C324	24567683	PF, 0.068 $\mu$ F
C325	24590183	PF, 0.018 $\mu$ F
C326	24591222	PF, 2200pF
C327	24617787	EL, 470 $\mu$ F, $\pm 20\%$ , 16V
C341	24794101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
C342	24795100	EL, 10 $\mu$ F, $\pm 20\%$ , 25V
C402	24232103	CD, 0.01 $\mu$ F, $+80\%$ , $-20\%$
C403	24590223	PF, 0.022 $\mu$ F
C404	24669229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V
C406	24590104	PF, 0.1 $\mu$ F
C407	24232103	CD, 0.01 $\mu$ F, $+80\%$ , $-20\%$
C409	24212102	CD, 1000pF, $\pm 10\%$
C413	24214821	CD, 820pF, $\pm 10\%$ , 500V
C417	24214391	CD, 390pF, $\pm 10\%$ , 500V
C420	24794101	EL, 100 $\mu$ F, $\pm 20\%$ , 16V
C430	24232103	CD, 0.01 $\mu$ F, $+80\%$ , $-20\%$
C431	24794102	EL, 1000 $\mu$ F, $\pm 20\%$ , 16V
C432	24232103	CD, 0.01 $\mu$ F, $+80\%$ , $-20\%$
C433	24794470	EL, 47 $\mu$ F, $\pm 20\%$ , 16V
C439	24232103	CD, 0.01 $\mu$ F, $+80\%$ , $-20\%$
C440	24082928	PF, 7000pF, $\pm 3\%$ , 1500V
C441	24693472	PF, 4700pF, 100V
C442	24082916	PF, 0.27 $\mu$ F, 315V
C443	24667102	EL, 1000 $\mu$ F, $\pm 20\%$ , 25V
C444	24082610	PF, 5600pF, $\pm 3\%$ , 1800V
C445	24828563	PF, 0.056 $\mu$ F, 200V
C446	24829393	PF, 0.039 $\mu$ F, 400V
C447	24679220	EL, 22 $\mu$ F, $\pm 20\%$ , 250V
C448	24640908	EL, 33 $\mu$ F, $\pm 20\%$ , 160V
C463	24212222	CD, 2200pF, $\pm 10\%$
C464	24640872	EL, 10 $\mu$ F, $\pm 20\%$ , 100V
C466	24797478	EL, 0.47 $\mu$ F, $\pm 20\%$ , 50V
C467	24082095	PF, 0.018 $\mu$ F, $\pm 3\%$ , 630V
C470	24666220	EL, 22 $\mu$ F, $\pm 20\%$ , 16V
C472	24567474	PF, 0.47 $\mu$ F
C477	24567393	PF, 0.039 $\mu$ F
C478	24567224	PF, 0.22 $\mu$ F
C501	24797478	EL, 0.47 $\mu$ F, $\pm 20\%$ , 50V
C502	24590103	PF, 0.01 $\mu$ F
C503	24797229	EL, 2.2 $\mu$ F, $\pm 20\%$ , 50V

Location No.	Part No.	Description
C504	24538104	PF, 0.1 $\mu$ F
C505	24538104	PF, 0.1 $\mu$ F
C508	24353120	CD, 12pF
C509	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
C510	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C511	24794101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
C512	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C513	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C514	24590104	PF, 0.1 $\mu$ F
C515	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C521	24797010	EL, 1 $\mu$ F, $\pm$ 20%, 50V
C610	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
C612	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C661	24591102	PF, 1000pF
C662	24591102	PF, 1000pF
C663	24766100	EL, 10 $\mu$ F, $\pm$ 20%, 50V
C670	24667470	EL, 47 $\mu$ F, $\pm$ 20%, 25V
C671	24667470	EL, 47 $\mu$ F, $\pm$ 20%, 25V
C673	24669229	EL, 2.2 $\mu$ F, $\pm$ 20%, 50V
C676	24591104	PF, 0.1 $\mu$ F
C677	24591104	PF, 0.1 $\mu$ F
C678	24669229	EL, 2.2 $\mu$ F, $\pm$ 20%, 50V
C679	24667470	EL, 47 $\mu$ F, $\pm$ 20%, 25V
C681	24668102	EL, 1000 $\mu$ F, $\pm$ 20%, 35V
C682	24668101	EL, 100 $\mu$ F, $\pm$ 20%, 35V
C683	24668102	EL, 1000 $\mu$ F, $\pm$ 20%, 35V
C690	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C704	24591822	PF, 8200pF
C705	24232103	CD, 0.01 $\mu$ F, +80%, -20%
C707	24795470	EL, 47 $\mu$ F, $\pm$ 20%, 25V
C712	24795470	EL, 47 $\mu$ F, $\pm$ 20%, 25V
C713	24790100	EL, 10 $\mu$ F, $\pm$ 20%, 160V
C714	24436101	CD, 100pF
C715	24214472	CD, 4700pF, $\pm$ 10%, 500V
C716	24436101	CD, 100pF
C717	24214472	CD, 4700pF, $\pm$ 10%, 500V
C718	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C719	24435560	CD, 56pF, 500V
C720	24790100	EL, 10 $\mu$ F, $\pm$ 20%, 160V
C721	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C722	24436561	CD, 560pF
C726	24212102	CD, 1000pF, $\pm$ 10%
△C801	24082927	PF, 0.22 $\mu$ F, $\pm$ 20%, AC275V
C805	24092281	CD, 4700pF, $\pm$ 20%, AC250V
C806	24092281	CD, 4700pF, $\pm$ 20%, AC250V
C810	24086934	EL, 560 $\mu$ F, $\pm$ 20%, 450V
△C813	24092567	CD, 1000pF, $\pm$ 20%, AC250V
△C814	24092567	CD, 1000pF, $\pm$ 20%, AC250V
C819	24567474	PF, 0.47 $\mu$ F
C831	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
C841	24796100	EL, 10 $\mu$ F, $\pm$ 20%, 35V
C842	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
C843	24567104	PF, 0.1 $\mu$ F
C846	24567224	PF, 0.22 $\mu$ F
C860	24214103	CD, 0.01 $\mu$ F, $\pm$ 10%, 500V
C861	24214471	CD, 470pF, $\pm$ 10%, 500V
C862	24082857	PF, 680pF, $\pm$ 2%
C863	24567104	PF, 0.1 $\mu$ F
C864	24092476	CD, 330pF, $\pm$ 10%, 2kV
C866	24538474	PF, 0.47 $\mu$ F
C867	24590272	PF, 2700pF
C868	24676470	EL, 47 $\mu$ F, $\pm$ 20%, 100V
C869	24678229	EL, 2.2 $\mu$ F, $\pm$ 20%, 200V
C870	24082890	PF, 0.082 $\mu$ F, 800V

Location No.	Part No.	Description
C871	24092484	CD, 1500pF, $\pm$ 10%, 2kV
C873	24567224	PF, 0.22 $\mu$ F
C876	24567474	PF, 0.47 $\mu$ F
C877	24667470	EL, 47 $\mu$ F, $\pm$ 20%, 25V
C884	24086916	EL, 330 $\mu$ F, $\pm$ 20%, 160V
C885	24214471	CD, 470pF, $\pm$ 10%, 500V
C886	24214471	CD, 470pF, $\pm$ 10%, 500V
C889	24668222	EL, 2200 $\mu$ F, $\pm$ 20%, 35V
C891	24082229	PF, 0.1 $\mu$ F, $\pm$ 10%, 250V
C892	24790100	EL, 10 $\mu$ F, $\pm$ 20%, 160V
C893	24092338	CD, 270pF, $\pm$ 10%, 2kV
C894	24092338	CD, 270pF, $\pm$ 10%, 2kV
C898	24212102	CD, 1000pF, $\pm$ 10%
C902	24092345	CD, 1000pF, $\pm$ 10%, 2kV
C903	24436121	CD, 120pF
C904	24436471	CD, 470pF
C905	24436471	CD, 470pF
C906	24436121	CD, 120pF
C907	24436471	CD, 470pF
C908	24436121	CD, 120pF
C909	24679220	EL, 22 $\mu$ F, $\pm$ 20%, 250V
C910	24797478	EL, 0.47 $\mu$ F, $\pm$ 20%, 50V
C911	24203100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
C912	24794102	EL, 1000 $\mu$ F, $\pm$ 20%, 16V
C913	24794220	EL, 22 $\mu$ F, $\pm$ 20%, 16V
C914	24212103	CD, 0.01 $\mu$ F, $\pm$ 10%
C930	24214101	CD, 100pF, $\pm$ 10%, 500V
C931	24214101	CD, 100pF, $\pm$ 10%, 500V
CA10	24212271	CD, 270pF, $\pm$ 10%
CA22	24436150	CD, 15pF
CA23	24436150	CD, 15pF
CA24	24436150	CD, 15pF
CA25	24436150	CD, 15pF
CA33	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CA34	24212101	CD, 100pF, $\pm$ 10%
CA36	24436470	CD, 47pF
CA37	24212101	CD, 100pF, $\pm$ 10%
CA38	24212101	CD, 100pF, $\pm$ 10%
CA42	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CA43	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CA44	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CA68	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CA69	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CB01	24794470	EL, 47 $\mu$ F, $\pm$ 20%, 16V
CB20	24212101	CD, 100pF, $\pm$ 10%
CB21	24212221	CD, 220pF, $\pm$ 10%
CS01	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CS02	24797010	EL, 1 $\mu$ F, $\pm$ 20%, 50V
CS03	24797010	EL, 1 $\mu$ F, $\pm$ 20%, 50V
CS04	24797010	EL, 1 $\mu$ F, $\pm$ 20%, 50V
CS05	24797010	EL, 1 $\mu$ F, $\pm$ 20%, 50V
CS06	24797010	EL, 1 $\mu$ F, $\pm$ 20%, 50V
CS07	24797010	EL, 1 $\mu$ F, $\pm$ 20%, 50V
CS10	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CS11	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CS29	24203220	EL, 22 $\mu$ F, $\pm$ 20%, 16V
CT01	24591104	PF, 0.1 $\mu$ F
CT02	24353100	CD, 10pF, $\pm$ 0.25pF
CT03	24353150	CD, 15pF
CT04	24212102	CD, 1000pF, $\pm$ 10%
CT05	24591104	PF, 0.1 $\mu$ F
CT06	24591104	PF, 0.1 $\mu$ F
CT07	24085944	EL, 2.2 $\mu$ F, $\pm$ 20%, 50V, Non-Polar

Location No.	Part No.	Description
CT08	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CT09	24763101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
CT10	24473220	CD, 22pF
CT14	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CT15	24474101	CD, 100pF, $\pm$ 10%
CT16	24436220	CD, 22pF
CV01	24794101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
CV02	24567103	PF, 0.01 $\mu$ F
CV11	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV20	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CV22	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CV30	24085981	EL, 10 $\mu$ F, $\pm$ 20%, 16V, Non-Polar
CV32	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV33	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV34	24762471	EL, 470 $\mu$ F, $\pm$ 20%, 10V
CV35	24232103	CD, 0.01 $\mu$ F, +80%, -20%
CV36	24794221	EL, 220 $\mu$ F, $\pm$ 20%, 16V
CV39	24794100	EL, 10 $\mu$ F, $\pm$ 20%, 16V
CZ01	24794101	EL, 100 $\mu$ F, $\pm$ 20%, 16V
CZ03	24085981	EL, 10 $\mu$ F, $\pm$ 20%, 16V, Non-Polar

#### RESISTORS

R101	24382183	OMF, 18k ohm, 1W
R102	24942226	CC, 22M ohm, 1/2W
R103	24366333	CF, 33k ohm
R104	24366225	CF, 2.2M ohm
R105	24366333	CF, 33k ohm
R106	24000245	MF, 33k ohm, $\pm$ 1%, 1/4W
R107	24366221	CF, 220 ohm
R108	24000245	MF, 33k ohm, $\pm$ 1%, 1/4W
R109	24366223	CF, 22k ohm
R210	24366271	CF, 270 ohm
R211	24366271	CF, 270 ohm
R212	24366271	CF, 270 ohm
R213	24366223	CF, 22k ohm
R214	24366824	CF, 820k ohm
R215	24366222	CF, 2200 ohm
R216	24366102	CF, 1k ohm
R217	24367822	CF, 8200 ohm, $\pm$ 2%
R217	24366122	CF, 1200 ohm
R220	24366101	CF, 100 ohm
R221	24366222	CF, 2200 ohm
R228	24367822	CF, 8200 ohm, $\pm$ 2%
R303	24366153	CF, 15k ohm
R304	24366104	CF, 100k ohm
R305	24322758	MF, 0.75 ohm, 1W
R306	24366473	CF, 47k ohm
R307	24366204	CF, 200k ohm
R308	24366102	CF, 1k ohm
R312	24382122	OMF, 1200 ohm, 1W
R314	24366103	CF, 10k ohm
R314	24366105	CF, 1M ohm
R315	24366824	CF, 820k ohm
R316	24366154	CF, 150k ohm
R318	24366471	CF, 470 ohm
R319	24366471	CF, 470 ohm
R320	24366101	CF, 100 ohm
R327	24321109	MF, 1 ohm, 1/2W
R328	24339479	MF, 4.7 ohm, 2W
R329	24366223	CF, 22k ohm
R330	24366102	CF, 1k ohm
R330	24366102	CF, 1k ohm

Location No.	Part No.	Description
R331	24366183	CF, 18k ohm
R331	24366104	CF, 100k ohm
R332	24366392	CF, 3900 ohm
R332	24366223	CF, 22k ohm
R333	24366103	CF, 10k ohm
R336	24383221	OMF, 220 ohm, 2W
R338	24366183	CF, 18k ohm
R340	24382471	OMF, 470 ohm, 1W
R341	24366182	CF, 1800 ohm
R342	24366562	CF, 5600 ohm
R343	24310109	MF, 1.0 ohm, 1/2W
R344	24366392	CF, 3900 ohm
R349	24366153	CF, 15k ohm
R362	24366224	CF, 220k ohm
R374	24366104	CF, 100k ohm
R375	24366473	CF, 47k ohm
R401	24366104	CF, 100k ohm
R402	24366103	CF, 10k ohm
R403	24366472	CF, 4700 ohm
R405	24366103	CF, 10k ohm
R407	24366272	CF, 2700 ohm
R411	24366561	CF, 560 ohm
R413	24366151	CF, 150 ohm
R415	24382272	OMF, 2700 ohm, 1W
R416	24019321	OMF, 1500 ohm, 5W
R424	24546209	FR, 2.0 ohm, 1/2W
R425	24381471	OMF, 470 ohm, 1/2W
R426	24366751	CF, 750 ohm
R427	24366392	CF, 3900 ohm
R428	24366561	CF, 560 ohm
R429	24552560	OMF, 56 ohm, 1/2W
R430	24366103	CF, 10k ohm
R430	24366222	CF, 2200 ohm
R432	24531120	FR, 12 ohm, 1/2W
R433	24366472	CF, 4700 ohm
R434	24552121	OMF, 120 ohm, 1/2W
R441	24532102	FR, 1k ohm, 1W
R447	24382472	OMF, 4700 ohm, 1W
R448	24338478	MF, 0.47 ohm, 1W
R461	24366393	CF, 39k ohm
R463	24323689	MF, 6.8 ohm, 2W
R464	24366102	CF, 1k ohm
R465	24366472	CF, 4700 ohm
R466	24366333	CF, 33k ohm
R467	24366103	CF, 10k ohm
R470	24338568	MF, 0.56 ohm, 1W
R471	24531271	FR, 270 ohm, 1/2W
R473	24366153	CF, 15k ohm
R474	24381393	OMF, 39k ohm, 1/2W
R476	24366183	CF, 18k ohm
R477	24366184	CF, 180k ohm
R479	24531680	FR, 68 ohm, 1/2W
R480	24366561	CF, 560 ohm
R501	24366273	CF, 27k ohm
R509	24366102	CF, 1k ohm
R510	24366102	CF, 1k ohm
R610	24366273	CF, 27k ohm
R612	24366103	CF, 10k ohm
R661	24366122	CF, 1200 ohm
R662	24366122	CF, 1200 ohm
R663	24366333	CF, 33k ohm
R664	24366333	CF, 33k ohm
R667	24366103	CF, 10k ohm
R668	24366103	CF, 10k ohm

Location No.	Part No.	Description
R669	24366103	CF, 10k ohm
R676	24366229	CF, 2.2 ohm
R677	24366229	CF, 2.2 ohm
R702	24366222	CF, 2200 ohm
R709	24366563	CF, 56k ohm
R713	24366393	CF, 39k ohm
R715	24366223	CF, 22k ohm
R716	24366273	CF, 27k ohm
R717	24366333	CF, 33k ohm
R719	24366392	CF, 3900 ohm
R720	24365392	CF, 3900 ohm
R721	24366102	CF, 1k ohm
R722	24552471	OMF, 470 ohm, 1/2W
R723	24366471	CF, 470 ohm
R724	24366470	CF, 47 ohm
R725	24366182	CF, 1800 ohm
R730	24552100	OMF, 10 ohm, 1/2W
R731	24552331	OMF, 330 ohm, 1/2W
R732	24366820	CF, 82 ohm
R733	24366683	CF, 68k ohm
R734	24366820	CF, 82 ohm
R735	24366683	CF, 68k ohm
R736	24366620	CF, 62 ohm
R737	24366152	CF, 1500 ohm
R738	24366123	CF, 12k ohm
R739	24366152	CF, 1500 ohm
R740	24366620	CF, 62 ohm
R741	24366279	CF, 2.7 ohm
R742	24366279	CF, 2.7 ohm
R743	24554221	OMF, 220 ohm, 2W
R744	24366122	CF, 1200 ohm
R745	24366122	CF, 1200 ohm
R760	24366101	CF, 100 ohm
R775	24366182	CF, 1800 ohm
△ R801	24009954	Metal-Glazed Resistor, 2.2M ohm, 1/2W
R808	24019340	PTC Thermistor, 18 ohm, 290V
R811	24568271	Cement, 270 ohm, 7W
R812	24510479	Cement, 4.7 ohm, 5W
R813	24007061	Cement, 1.8 ohm, ±10%, 2W
R816	24366471	CF, 470 ohm
R817	24366331	CF, 330 ohm
R818	24366561	CF, 560 ohm
R819	24366102	CF, 1k ohm
R830	24548399	FR, 3.9 ohm, 2W
R831	24366331	CF, 330 ohm
R840	24531120	FR, 12 ohm, 1/2W
R841	24366752	CF, 7500 ohm
R846	24366332	CF, 3300 ohm
R848	24366470	CF, 47 ohm
R861	24384223	OMF, 22k ohm, 3W
R862	24552220	OMF, 22 ohm, 1/2W
R864	24552102	OMF, 1k ohm, 1/2W
R866	24381470	OMF, 47 ohm, 1/2W
R867	24366124	CF, 120k ohm
R868	24552103	OMF, 10k ohm, 1/2W
R870	24381750	OMF, 75 ohm, 1/2W
R871	24310109	MF, 1.0 ohm, 1/2W
R872	24377224	CF, 220k ohm, 1W
R874	24366124	CF, 120k ohm
R883	24552752	OMF, 7500 ohm, 1/2W
R884	24552752	OMF, 7500 ohm, 1/2W
R888	24322228	MF, 0.22 ohm, 1W

Location No.	Part No.	Description
R892	24366101	CF, 100 ohm
△ R899	24005014	MF, 8.2M ohm, 1W
R901	24376102	CF, 1k ohm, 1/2W
R902	24376102	CF, 1k ohm, 1/2W
R903	24376102	CF, 1k ohm, 1/2W
R904	24366472	CF, 4700 ohm
R905	24366150	CF, 15 ohm
R912	24366221	CF, 220 ohm
R914	24366561	CF, 560 ohm
R915	24366121	CF, 120 ohm
R916	24366560	CF, 56 ohm
R917	24366391	CF, 390 ohm
R918	24366270	CF, 27 ohm
R919	24366221	CF, 220 ohm
R920	24000906	FR, 2.4 ohm, 2W
R921	24366561	CF, 560 ohm
R922	24366121	CF, 120 ohm
R924	24366270	CF, 27 ohm
R925	24366391	CF, 390 ohm
R926	24366221	CF, 220 ohm
R928	24366561	CF, 560 ohm
R929	24366121	CF, 120 ohm
R930	24366270	CF, 27 ohm
R932	24366102	CF, 1k ohm
R934	24366681	CF, 680 ohm
R935	24366272	CF, 2700 ohm
R936	24545150	FR, 15 ohm, 1/4W
R937	24366391	CF, 390 ohm
R942	24366562	CF, 5600 ohm
R943	24366562	CF, 5600 ohm
R944	24366562	CF, 5600 ohm
R945	24366560	CF, 56 ohm
R946	24366560	CF, 56 ohm
R960	24383153	OMF, 15k ohm, 2W
R961	24383153	OMF, 15k ohm, 2W
R962	24383153	OMF, 15k ohm, 2W
R963	24383153	OMF, 15k ohm, 2W
R964	24383153	OMF, 15k ohm, 2W
R965	24383153	OMF, 15k ohm, 2W
R977	24366122	CF, 1200 ohm
R992	24366150	CF, 15 ohm
RA02	24366102	CF, 1k ohm
RA03	24366102	CF, 1k ohm
RA04	24366682	CF, 6800 ohm
RA07	24366102	CF, 1k ohm
RA08	24366102	CF, 1k ohm
RA09	24366102	CF, 1k ohm
RA10	24366102	CF, 1k ohm
RA11	24366102	CF, 1k ohm
RA12	24366102	CF, 1k ohm
RA13	24366102	CF, 1k ohm
RA15	24366433	CF, 43k ohm
RA16	24366102	CF, 1k ohm
RA17	24366102	CF, 1k ohm
RA18	24366102	CF, 1k ohm
RA19	24366221	CF, 220 ohm
RA22	24366152	CF, 1500 ohm
RA23	24366152	CF, 1500 ohm
RA24	24366152	CF, 1500 ohm
RA25	24366102	CF, 1k ohm
RA26	24366102	CF, 1k ohm
RA27	24366102	CF, 1k ohm
RA30	24366223	CF, 22k ohm
RA31	24366103	CF, 10k ohm

Location No.	Part No.	Description
RA33	24366103	CF, 10k ohm
RA34	24366103	CF, 10k ohm
RA35	24366102	CF, 1k ohm
RA36	24366333	CF, 33k ohm
RA37	24366331	CF, 330 ohm
RA38	24366331	CF, 330 ohm
RA40	24366331	CF, 330 ohm
RA41	24366331	CF, 330 ohm
RA61	24366103	CF, 10k ohm
RA62	24366103	CF, 10k ohm
RA64	24366333	CF, 33k ohm
RA65	24366333	CF, 33k ohm
RA67	24366103	CF, 10k ohm
RA68	24366103	CF, 10k ohm
RA70	24366333	CF, 33k ohm
RA71	24366683	CF, 68k ohm
RA72	24366223	CF, 22k ohm
RA73	24366103	CF, 10k ohm
RA509	24366391	CF, 390 ohm
RA510	24366391	CF, 390 ohm
RB01	24366271	CF, 270 ohm
RB02	24366221	CF, 220 ohm
RB03	24366101	CF, 100 ohm
RB09	24366470	CF, 47 ohm
RB11	24366103	CF, 10k ohm
RB12	24366223	CF, 22k ohm
RB26	24366472	CF, 4700 ohm
RB27	24366103	CF, 10k ohm
RB28	24366104	CF, 100k ohm
RB30	24366103	CF, 10k ohm
RB43	24366103	CF, 10k ohm
RB44	24366562	CF, 5600 ohm
RB45	24366102	CF, 1k ohm
RB46	24366331	CF, 330 ohm
RB60	24366103	CF, 10k ohm
RB61	24366103	CF, 10k ohm
RR13	24366121	CF, 120 ohm
RR14	24366121	CF, 120 ohm
RR15	24366121	CF, 120 ohm
RR16	24366122	CF, 1200 ohm
RR17	24366122	CF, 1200 ohm
RR18	24366122	CF, 1200 ohm
RS01	24366103	CF, 10k ohm
RS02	24366104	CF, 100k ohm
RS03	24366103	CF, 10k ohm
RS04	24366104	CF, 100k ohm
RS09	24366820	CF, 82 ohm
RS14	24366101	CF, 100 ohm
RS15	24366101	CF, 100 ohm
RS17	24366472	CF, 4700 ohm
RS18	24366472	CF, 4700 ohm
RS19	24366101	CF, 100 ohm
RS20	24366222	CF, 2200 ohm
RS21	24366101	CF, 100 ohm
RS22	24366222	CF, 2200 ohm
RS23	24366102	CF, 1k ohm
RS24	24366102	CF, 1k ohm
RS27	24366561	CF, 560 ohm
RT01	24366332	CF, 3300 ohm
RT02	24366100	CF, 10 ohm
RT03	24366101	CF, 100 ohm
RT04	24366273	CF, 27k ohm
RT05	24366103	CF, 10k ohm
RT07	24366102	CF, 1k ohm

Location No.	Part No.	Description
RT08	24366103	CF, 10k ohm
RT09	24366101	CF, 100 ohm
RT15	24366101	CF, 100 ohm
RT16	24366101	CF, 100 ohm
RT17	24366102	CF, 1k ohm
RT18	24366152	CF, 1500 ohm
RT19	24366122	CF, 1200 ohm
RT20	24366471	CF, 470 ohm
RT21	24366561	CF, 560 ohm
RT97	24366102	CF, 1k ohm
RT98	24366102	CF, 1k ohm
RT99	24366102	CF, 1k ohm
RV01	24366103	CF, 10k ohm
RV05	24366223	CF, 22k ohm
RV10	24366101	CF, 100 ohm
RV11	24366472	CF, 4700 ohm
RV12	24366101	CF, 100 ohm
RV13	24366472	CF, 4700 ohm
RV14	24366101	CF, 100 ohm
RV21	24366221	CF, 220 ohm
RV24	24552101	OMF, 100 ohm, 1/2W
RV25	24366750	CF, 75 ohm
RV26	24366101	CF, 100 ohm
RV29	24366223	CF, 22k ohm
RV30	24366820	CF, 82 ohm
RV31	24366820	CF, 82 ohm
RV32	24366101	CF, 100 ohm
RV90	24366101	CF, 100 ohm
RV91	24366101	CF, 100 ohm

<b>COILS &amp; TRANSFORMERS</b>		
L202	23289100	Coil, Peaking, TRF4100AF
L301	23103859	Coil (Ferrite Bead), TEM2011
L302	23237975	Coil, Peaking, TRF4101AC
L430	23289470	Coil, Peaking, TRF4470AF
L431	23289100	Coil, Peaking, TRF4100AF
L441	23233072	Coil, Linearity, TLN2115G
L442	23248122	Coil, Choke, TLN3384D
L461	23248115	Coil, Choke, TLN3367D
L462	23231197	Deflection Yoke, TDY-629KS
L463	23103859	Coil (Ferrite Bead), TEM2011
L503	23289100	Coil, Peaking, TRF4100AF
L505	23289100	Coil, Peaking, TRF4100AF
L702	23261974	Coil, Choke, HC5-035
L704	23103859	Coil (Ferrite Bead), TEM2011
L705	23103859	Coil (Ferrite Bead), TEM2011
L805	23248150	Coil, Choke, TLN3427
L806	23248150	Coil, Choke, TLN3427
L861	23103859	Coil (Ferrite Bead), TEM2011
L862	23103937	Coil (Ferrite Bead), TEM2004
L883	23103775	Coil (Ferrite Bead), TEM2014
L884	23103775	Coil (Ferrite Bead), TEM2014
L885	23248073	Coil, Choke, TLN3299D
L886	23103859	Coil (Ferrite Bead), TEM2011
L887	23280016	Coil, Peaking, TRF4100AZ
L888	23103859	Coil (Ferrite Bead), TEM2011
△ L901	23200294	Coil, Degaussing, TSB-2366AG
L902	23289221	Coil, Peaking, TRF4221AF
L903	23289221	Coil, Peaking, TRF4221AF
L904	23289221	Coil, Peaking, TRF4221AF
L905	23289390	Coil, Peaking, TRF4390AF
L906	23289390	Coil, Peaking, TRF4390AF
L907	23289390	Coil, Peaking, TRF4390AF
LA01	23289100	Coil, Peaking, TRF4100AF

Location No.	Part No.	Description
LT01	23289339	Coil, Peaking, TRF43R3AF
LT02	23238562	Coil, Peaking, TRF4109AJ
LT03	23289150	Coil, Peaking, TRF4150AF
LT04	23238714	Coil, Peaking, TRF4100AJ
LT05	23238714	Coil, Peaking, TRF4100AJ
LT06	23238714	Coil, Peaking, TRF4100AJ
LT07	23238714	Coil, Peaking, TRF4100AJ
LT08	23103859	Coil (Ferrite Bead), TEM2011
LT10	23238506	Coil, Peaking, TRF4229AJ
LT12	23238506	Coil, Peaking, TRF4229AJ
LT13	23238506	Coil, Peaking, TRF4229AJ
LT15	23238710	Coil, Peaking, TRF4220AJ
LT97	23238714	Coil, Peaking, TRF4100AJ
LT98	23238714	Coil, Peaking, TRF4100AJ
LT99	23238714	Coil, Peaking, TRF4100AJ
T401	23224336	Transformer, Horiz. Drive, TLN1083
△ T461	23236529	Transformer, Flyback, TFB4132DD
△ T801	23211703	Line Filter, TRF3196AQ
△ T862	23217393	Transformer, Converter, TPW3397AS
<b>SEMICONDUCTORS</b>		
Q101	23114528	Transistor, 2SC1740S-Q
Q205	23114530	Transistor, 2SA933S-Q
Q220	23114530	Transistor, 2SA933S-Q
Q301	B0378560	IC, TA8427K
Q302	B0384625	IC, TA8859CP
Q310	A6002020	Transistor, RN1202
Q311	A6002040	Transistor, RN1204
Q340	23114530	Transistor, 2SA933S-Q
Q402	A678971D	Transistor, 2SC1569 FA-5
Q404	A6872801	Transistor, 2SD2253(FA)
Q420	23314141	Transistor, 2SC3852
Q421	23114528	Transistor, 2SC1740S-Q
Q430	23314141	Transistor, 2SC3852
Q432	A6002030	Transistor, RN1203
Q460	23314938	Transistor, 2SD2493(D)
Q461	23114530	Transistor, 2SA933S-Q
Q470	A6547250	Transistor, 2SA1320
Q501	B0101527	IC, TB1230N
Q608	A6342206	Transistor, 2SC2878-A(TE)
Q609	A6342206	Transistor, 2SC2878-A(TE)
Q610	B0376856	IC, TA8211AH
Q612	23114530	Transistor, 2SA933S-Q
Q706	23114528	Transistor, 2SC1740S-Q
Q707	A6734590	Transistor, 2SC752(G)TM-Y
Q709	23114528	Transistor, 2SC1740S-Q
Q710	23114530	Transistor, 2SA933S-Q
Q711	23314911	Transistor, 2SB1569A
Q712	23314914	Transistor, 2SD2400A
Q719	23114528	Transistor, 2SC1740S-Q
Q720	23114528	Transistor, 2SC1740S-Q
Q773	23114528	Transistor, 2SC1740S-Q
Q801	23906249	IC, STR-Z4302A
Q817	23114528	Transistor, 2SC1740S-Q
Q818	A6012010	Transistor, RN2201
Q819	23114528	Transistor, 2SC1740S-Q
Q830	23314141	Transistor, 2SC3852
Q840	23318299	IC, L78MR05
Q843	A6002050	Transistor, RN1205
Q846	A6360200	Transistor, 2SC3333
△ Q862	A8643108	Photo Coupler, TLP621(GR-LF)

Location No.	Part No.	Description
Q872	23314141	Transistor, 2SC3852
Q883	A6907752	IC, S1854 FA-1
Q901	23314811	Transistor, 2SC5147
Q902	23114528	Transistor, 2SC1740S-Q
Q903	23314811	Transistor, 2SC5147
Q904	23114528	Transistor, 2SC1740S-Q
Q905	23314811	Transistor, 2SC5147
Q906	23114528	Transistor, 2SC1740S-Q
Q907	23114530	Transistor, 2SA933S-Q
Q908	A6321265	Transistor, 2SC2120-Y(TE)
QA01	23906323	IC, M37222M6-F83 (2975DE)
QA01	23906232	IC, M37222M6-E88SP (2975SH)
QA02	23904665	IC, NM24C04EN
QA03	23114528	Transistor, 2SC1740S-Q
QA04	23114528	Transistor, 2SC1740S-Q
QB01	23114528	Transistor, 2SC1740S-Q
QB02	23114530	Transistor, 2SA933S-Q
QB03	A6002050	Transistor, RN1205
QB21	23114528	Transistor, 2SC1740S-Q
QB30	23114528	Transistor, 2SC1740S-Q
QB40	23114528	Transistor, 2SC1740S-Q
QS01	23114528	Transistor, 2SC1740S-Q
QS02	23114528	Transistor, 2SC1740S-Q
QS03	A6342206	Transistor, 2SC2878-A(TE)
QS04	A6342206	Transistor, 2SC2878-A(TE)
QT01	23904899	IC, SAA5281ZP/E
QT04	23114530	Transistor, 2SA933S-Q
QT05	23114528	Transistor, 2SC1740S-Q
QV01	B0385655	IC, TA1219N
QV02	23114528	Transistor, 2SC1740S-Q
QV03	23114528	Transistor, 2SC1740S-Q
D101	23115922	Diode, Zener, $\mu$ PC574J(M)
D102	23118859	Diode, 1SS133
D103	23118859	Diode, 1SS133
D201	23316687	Diode, Zener, MTZJ9.1B
D202	23316687	Diode, Zener, MTZJ9.1B
D203	23316687	Diode, Zener, MTZJ9.1B
D204	23115537	Diode, 1SS131
D301	23118479	Diode, BYD33J
D305	23118859	Diode, 1SS133
D306	23118859	Diode, 1SS133
D308	23118479	Diode, BYD33J
D319	23118822	Diode, ERB12-02
D320	23118822	Diode, ERB12-02
D332	23316794	Diode, SC570A
D340	23316650	Diode, Zener, MTZJ2.4A
D401	23316685	Diode, Zener, MTZJ8.2C
D403	23316667	Diode, Zener, MTZJ4.7C
D406	23118479	Diode, BYD33J
D408	A7580658	Diode, 3JH41
D420	23316680	Diode, Zener, MTZJ7.5A
D431	23316690	Diode, Zener, MTZJ10B
D441	23316688	Diode, Zener, MTZJ9.1C
D443	23118859	Diode, 1SS133
D461	23316582	Diode, ERC20-06
D464	23316648	Diode, Zener, MTZJ2.2A
D467	A7568754	Diode, 1S1887AFA-1
D468	23316718	Diode, Zener, MTZJ12A
D470	23316719	Diode, Zener, MTZJ12B
D477	23115537	Diode, 1SS131
D610	23118859	Diode, 1SS133
D611	23118859	Diode, 1SS133
D612	23118859	Diode, 1SS133
D615	23118859	Diode, 1SS133

Location No.	Part No.	Description
D616	23118859	Diode, 1SS133
D617	23118859	Diode, 1SS133
D618	23118859	Diode, 1SS133
D619	23118859	Diode, 1SS133
D704	23115537	Diode, 1SS131
D705	23115537	Diode, 1SS131
D715	23115537	Diode, 1SS131
D720	23115537	Diode, 1SS131
D721	23115537	Diode, 1SS131
D801	23316795	Diode, D6SB60L, F05
D818	23316723	Diode, Zener, MTZJ13C
D830	23316672	Diode, Zener, MTZJ5.6B
D842	23316360	Diode, Zener, UZ27BSC
D844	23316747	Diode, Zener, MTZJ27C
D845	23316686	Diode, Zener, MTZJ9.1A
D847	23316675	Diode, Zener, MTZJ6.2B
D862	23118094	Diode, EU2A
D864	23118094	Diode, EU2A
D872	23316724	Diode, Zener, MTZJ15A
D875	23316725	Diode, Zener, MTZJ15B
D876	23118859	Diode, 1SS133
D878	23316747	Diode, Zener, MTZJ27C
D880	23118859	Diode, 1SS133
D883	23316531	Diode, RG4
D884	23316531	Diode, RG4
D885	23316766	Diode, RU2YX
D886	23316766	Diode, RU2YX
D890	23118859	Diode, 1SS133
D891	23316554	Diode, 1SS146
D901	23115537	Diode, 1SS131
D903	23115537	Diode, 1SS131
D904	23115537	Diode, 1SS131
D905	23115537	Diode, 1SS131
D906	23115537	Diode, 1SS131
D907	23115537	Diode, 1SS131
D908	23115537	Diode, 1SS131
D909	23115537	Diode, 1SS131
D910	23115537	Diode, 1SS131
D911	A7568250	Diode, 1S1834
DA11	23118859	Diode, 1SS133
DA12	23118859	Diode, 1SS133
DA36	23118859	Diode, 1SS133
DA42	23316675	Diode, Zener, MTZJ6.2B
DA61	23118859	Diode, 1SS133
DA62	23118859	Diode, 1SS133
DA68	23316675	Diode, Zener, MTZJ6.2B
DB01	A8636650	Diode (LED), TLSG116
DB03	23358522	LED, SIR-56SB3F
DB30	23118859	Diode, 1SS133
<b>MISCELLANEOUS</b>		
B205	23470491	Frame, Back Terminal
E912	23848729	Rubber Wedge
△F470	23144829	Fuse, 1.0A
F470A	23165433	Holder, Fuse
△F801	23144508	Fuse, 4.0A
F801A	23165433	Holder, Fuse
G101	23221803	Coil, Choke, TLN3040D
G614	23238714	Coil, Peaking, TRF4100AJ
G615	23238714	Coil, Peaking, TRF4100AJ
G616	24366103	CF, 10k ohm
G714	24545220	FR, 22 ohm, 1/4W
G882	23316331	Diode, Zener, UZ11BSC
GA60	24366470	CF, 47 ohm

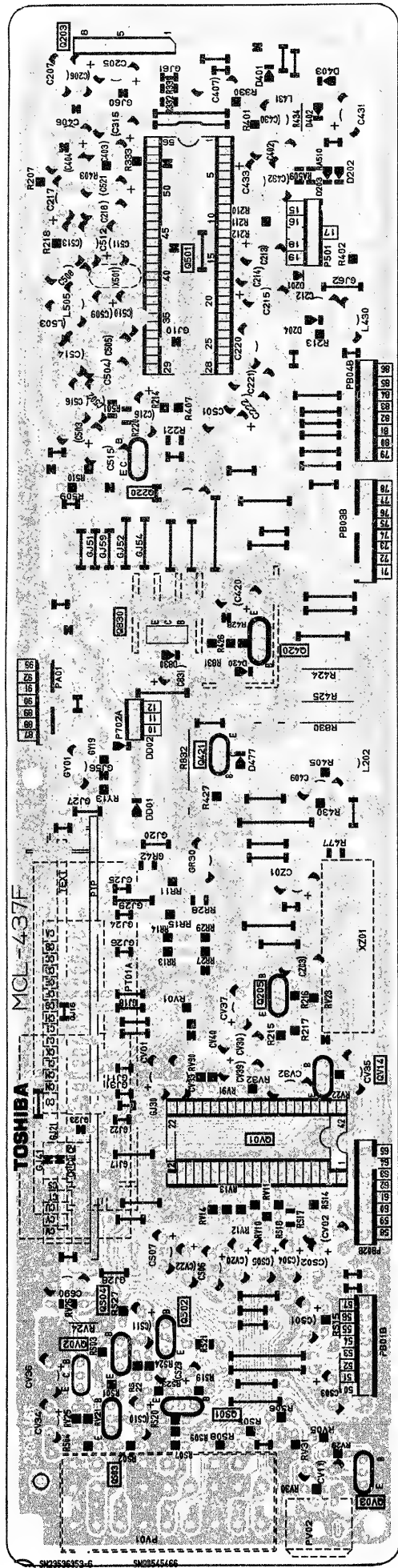
Location No.	Part No.	Description
H002	23148290	Module, MVCS45B, MULTI IF MPX A-PR
KB01	23904946	Remote Sensor, RPM-676CBR-S
L462A	23199314	Compensator, DY, TC-E
L462B	23948535	Convergence Corrector, TC-U(PLUS)
L462C	23948536	Convergence Corrector, TC-V(MINUS)
L462D	23199192	Conver Revision Board
△P801	23372024	Power Cord (2975DE)
△P801	23372027	Power Cord (2975SH)
PV01	23365867	Jack, 9P
PV02	23365818	Jack, SVHS
△S801	23344385	Switch, Power
SA01	23145227	Switch, Push, 1C1P
SA02	23145227	Switch, Push, 1C1P
SA03	23145227	Switch, Push, 1C1P
SA04	23145227	Switch, Push, 1C1P
SA05	23145227	Switch, Push, 1C1P
SA06	23145227	Switch, Push, 1C1P
△SR81	23146564	Relay, DC12V
UY01	23148291	Module, PMPN14H
△V901A	23902891	Socket, CRT, 10P
V901M	23102438	Magnet, Purity-Convergence, MAG-1093
W661	23351116	Speaker, SPK-1382, 60x120mm, 8 ohm
W662	23351116	Speaker, SPK-1382, 60x120mm, 8 ohm
X501	23153438	Crystal, 16.2
XA01	23153325	Ceramic Resonator, 8.00M, TCR1056
XT01	23153472	Crystal, 27M
XZ01	23303193	Filter, Comb, MN139T
Z860	23144451	Protector, PRF5000, 125V, 5A
<b>PC BOARD ASSEMBLIES</b>		
* U901		CRT Drive Board, PB7601
* U902		Signal Board, PB7786 (2975DE)
* U902		Signal Board, PB7696 (2975SH)
* U903		Pow/DEF Board, PB7689 (2975DE)
* U903		Pow/DEF Board, PB7697 (2975SH)
* U904		Text Board, PB7045 (2975DE)
* U905		Power S/W Board, PB7604
<b>PICTURE TUBE</b>		
△V901	23312742	Picture Tube, A68KVL74XDT3 (2975DE)
△V901	23312754	Picture Tube, A68KVL74X(DT (2975SH)
<b>TUNER</b>		
H001	23321269	Tuner, ECA14

Location No.	Part No.	Description
<b>ACCESSORIES</b>		
K902	23306194	Remote Hand Unit, CT-9881 (2975DE)
Y101	23563088	Owner's Manual, English, 2975DE/2975SH
K902	23306193	Remote Hand Unit, CT-9878 (2975SH)
Y101	23563089	Owner's Manual, Hong Kong, 2975SH

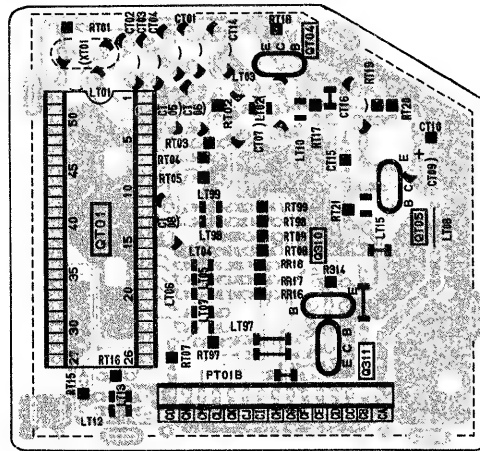
Location No.	Part No.	Description



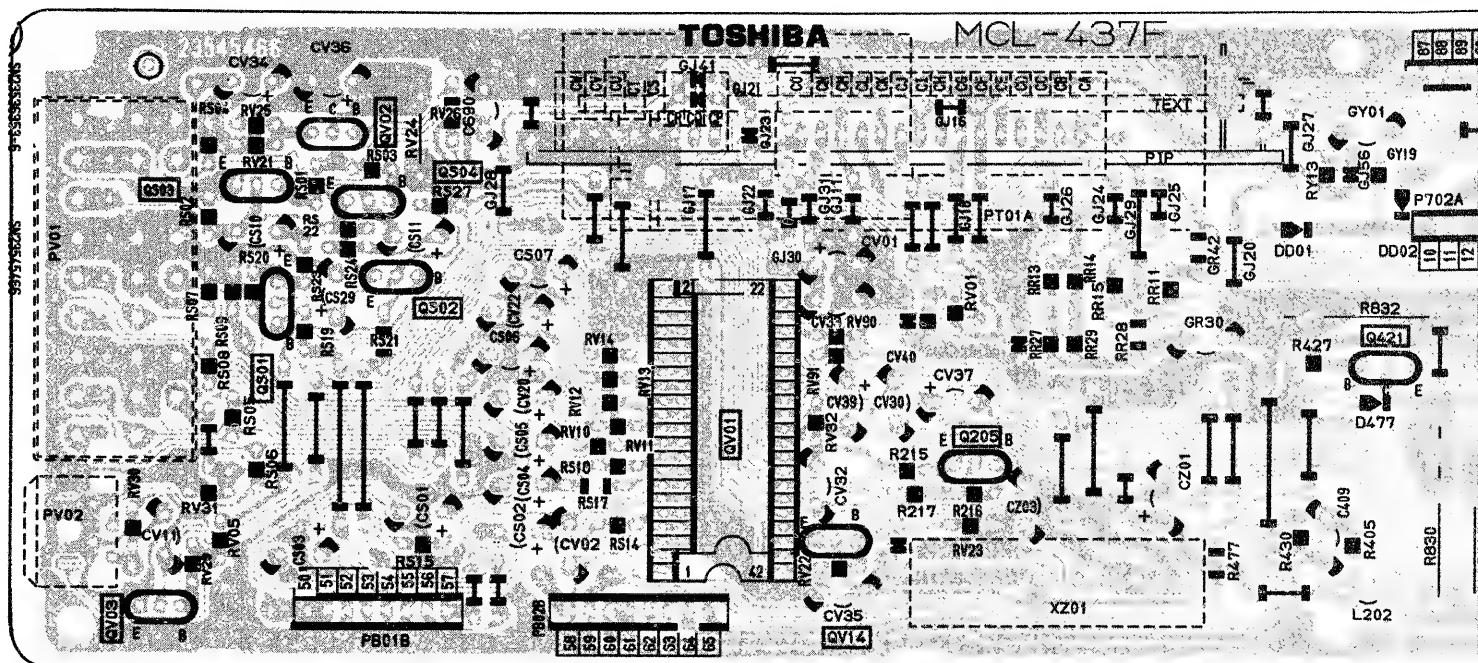
**SIGNAL BOARD PB7786**  
BOTTOM (FOIL) SIDE



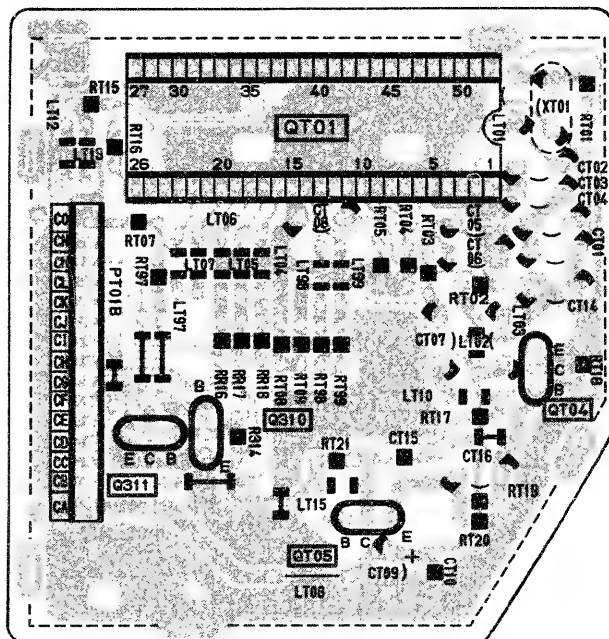
**TEXT BOARD PB7045 (2975DE only)**  
BOTTOM (FOIL) SIDE



# SIGNAL BOARD PE BOTTOM (FOIL) SIDE

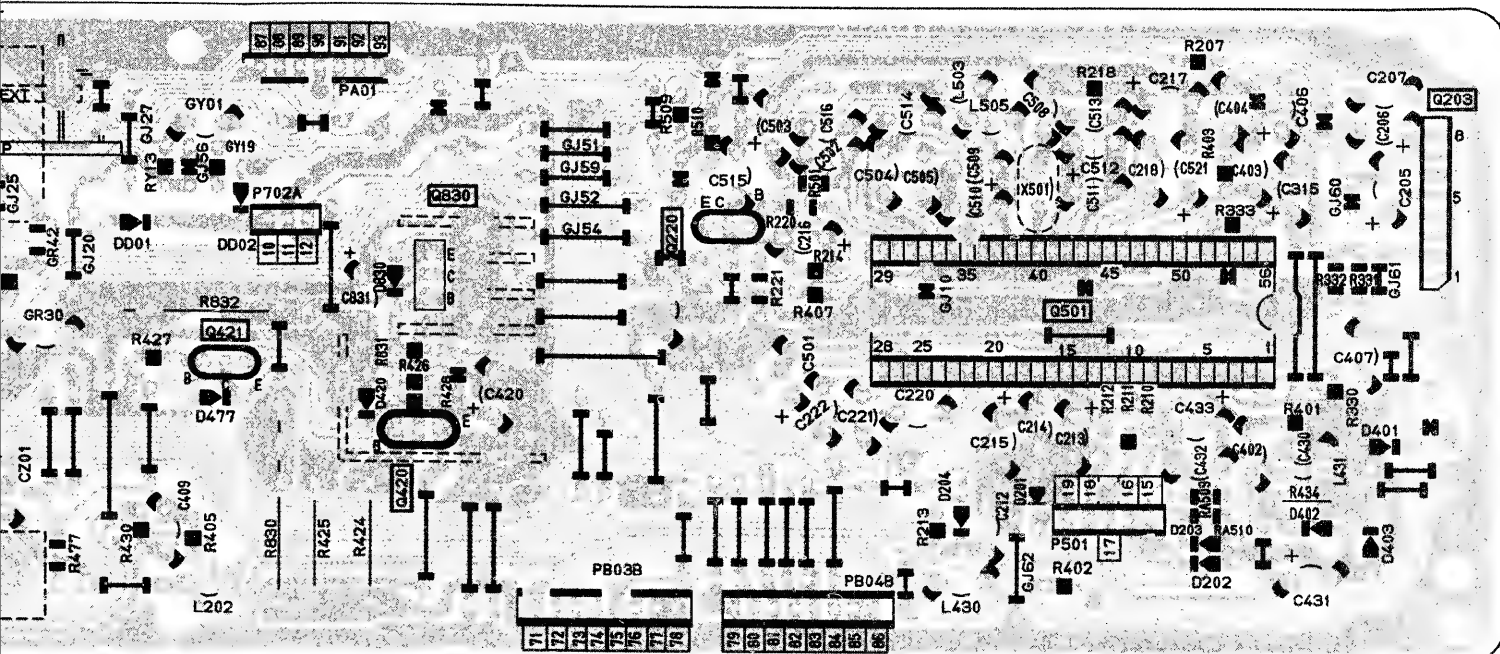


## TEXT BOARD PB7045 (2975DE only) BOTTOM (FOIL) SIDE



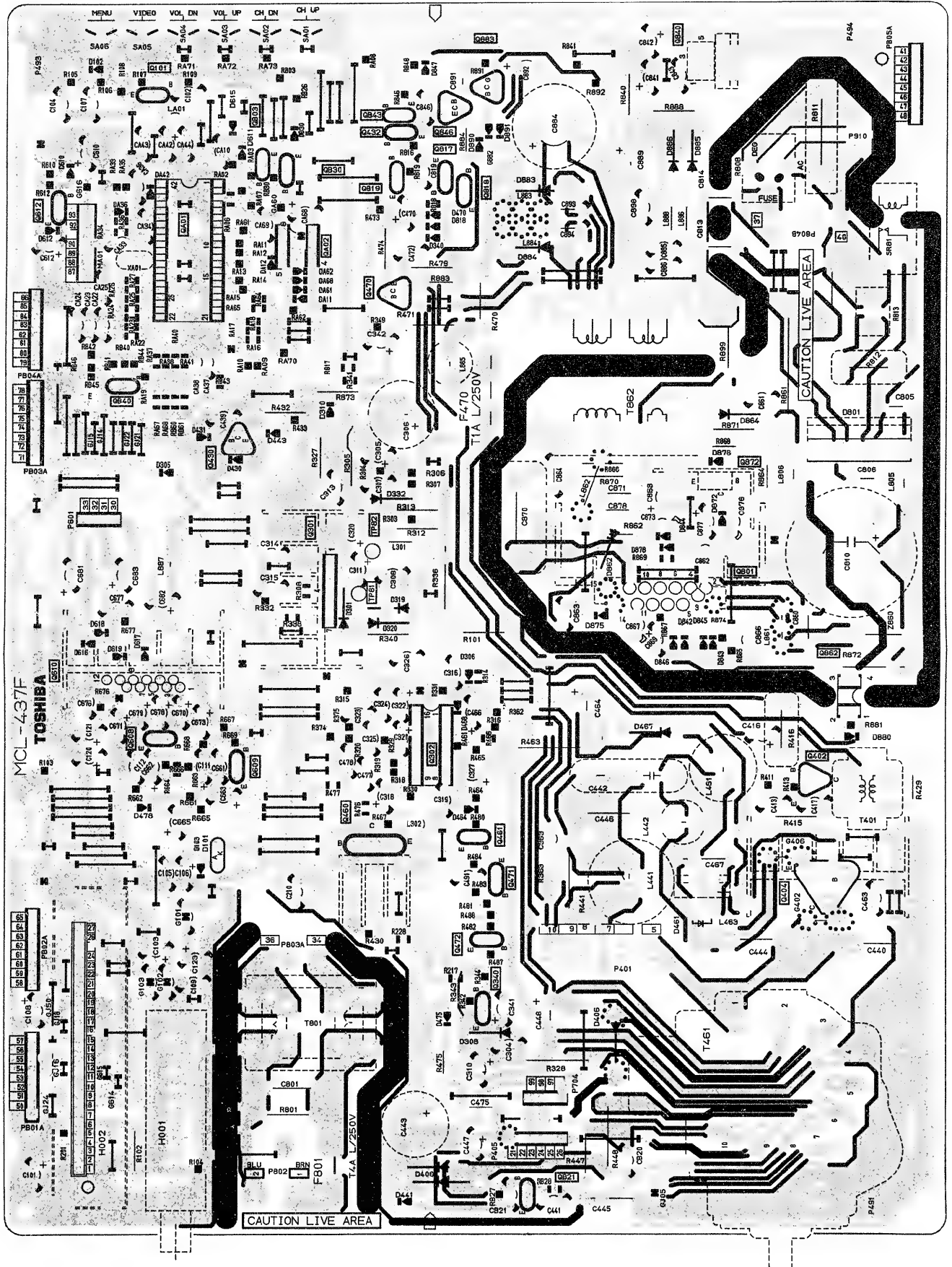
# FINAL BOARD PB7786

BOTTOM (FOIL) SIDE



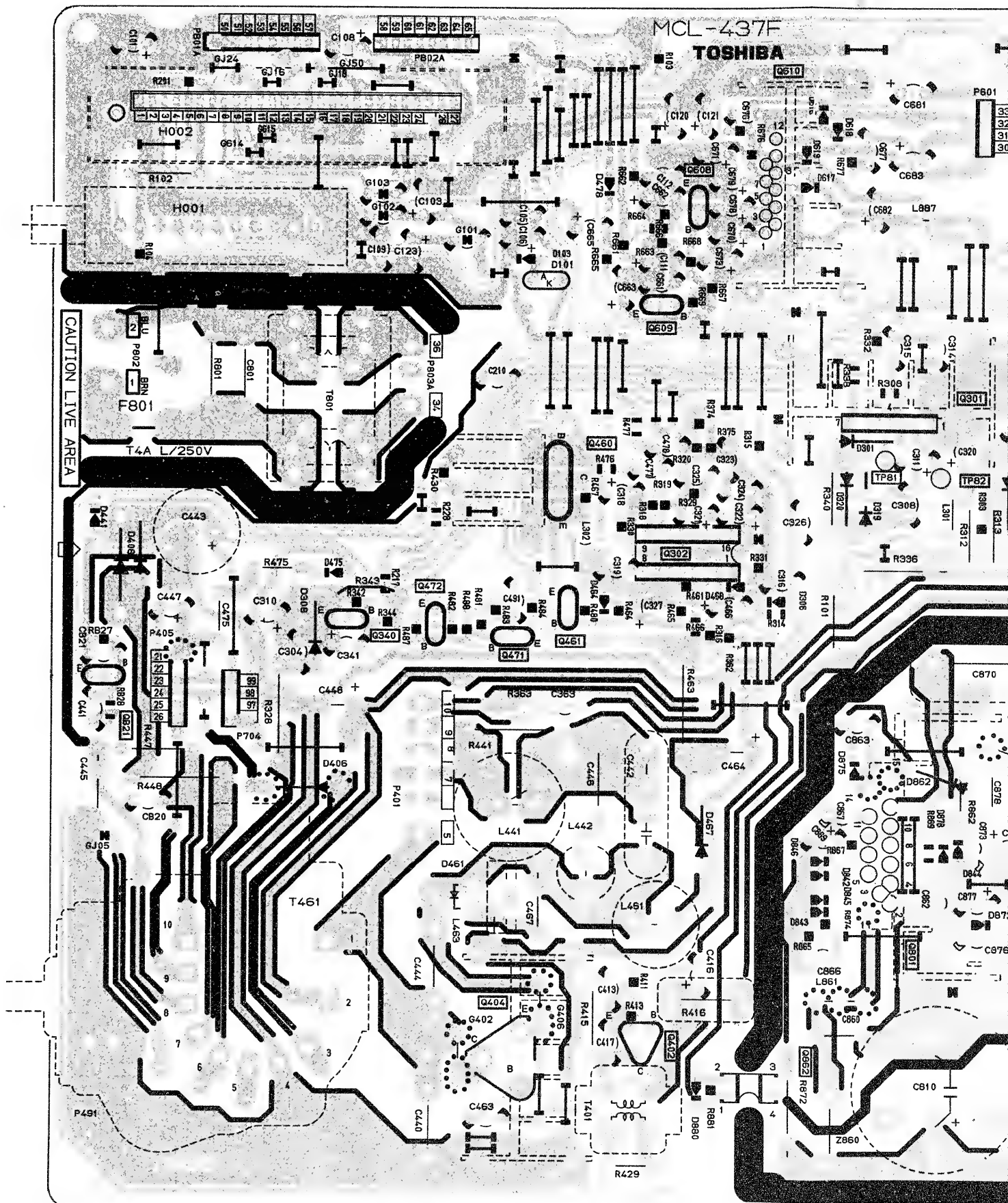
# POWER BOARD PB7789

BOTTOM (FOIL) SIDE





**POWER BOARD PB7789**  
**BOTTOM (FOIL) SIDE**



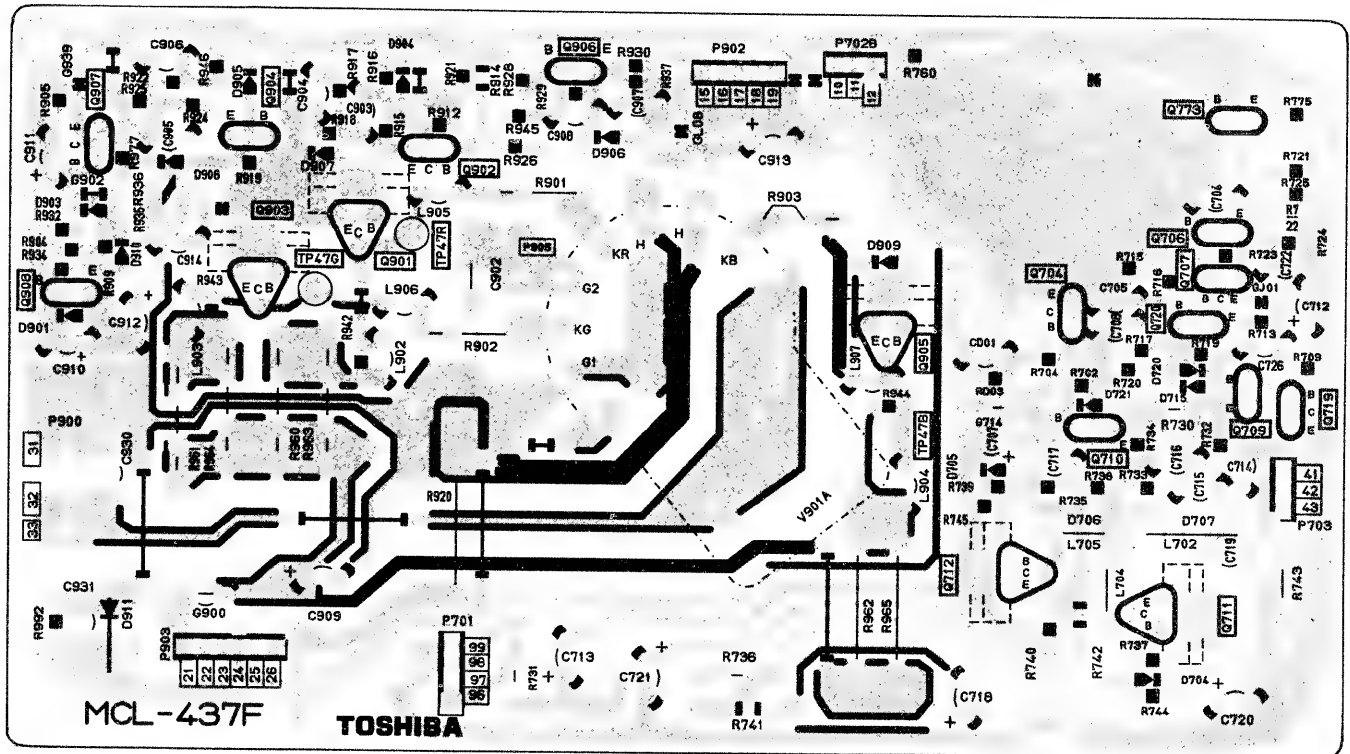
**BOTTOM (FOIL) SIDE**

CL-437F

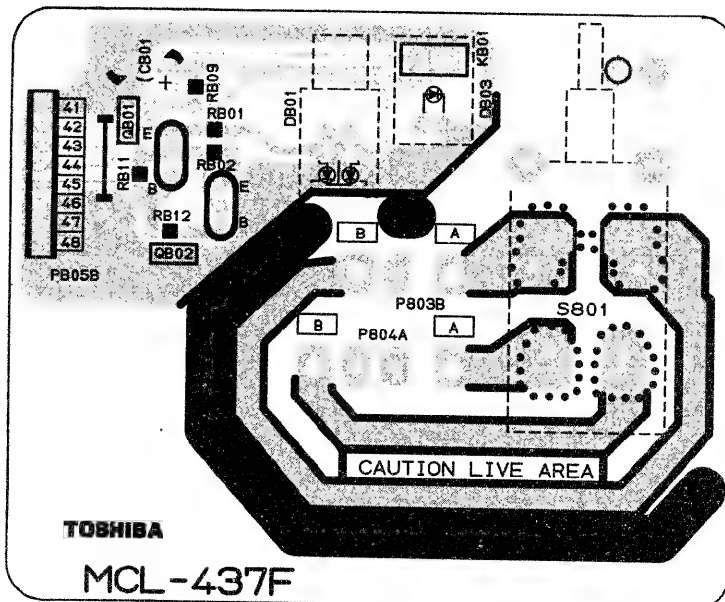
**TOSHIBA**



# **CRT DRIVE BOARD PB7601** **BOTTOM (FOIL) SIDE**

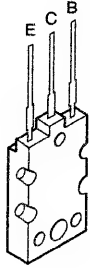


# **POWER SW BOARD PB7604** **BOTTOM (FOIL) SIDE**

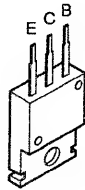


# TERMINAL VIEW OF TRANSISTORS

① 2SD2253  
(old)  
2SC5243



② 2SC3852  
2SD1763A  
2SC1569  
2SC4544  
2SA1788  
2SA1306  
2SA1186A



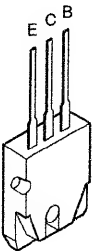
③ 2SC752GTM  
2SC2482  
2SC2655  
2SC4721P



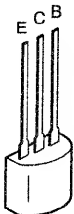
④ 2SC752  
2SA562TM  
2SA1015  
2SC1815  
2SC2878  
2SC1740S  
2SC2120  
2SA9335



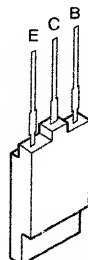
⑤ 2SA1788



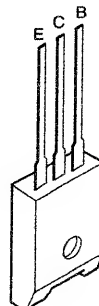
⑥ RN2203  
RN2201  
RN2004  
RN1203  
RN1204  
RN2204  
RN1205  
RN1202  
RN1201



⑦ 2SD1554  
2SD2253  
2SD1556  
2SC5143



⑧ ON4409





[illegible]

[illegible]

### SPECIFICATIONS

SPECIFICATIONS						
Rated voltage		AC 110 V – 240 V, 50/60 Hz				
Power consumption (at AC 220 V, 50 Hz)		120 W				
Dimensions		Width 808 mm × Height 584 mm × Depth 525 mm				
Mass		44 kg				
Picture tube (measured diagonally)		TYPE 29 (73 cm) Overall picture tube measured diagonally (68 cm) Viewable picture tube measured diagonally 110° deflection				
Television system (Aerial input)	Channel coverage	<b>System</b>	<b>Channel</b>	<b>VHF</b>	<b>UHF</b>	<b>CATV</b>
		PAL B/G	CCIR	2 – 12	21 – 69	X ~ Z+2, S1 ~ S41
		PAL I	UK	—	21 – 69	—
		PAL D/K	CHINA	1 – 12	13 – 57	Z-1 ~ Z-38
		NTSC M	US	2 – 13	14 – 69	A-6 ~ A-1, A ~ W, AA ~ ZZ, AAA, BBB
	Special RF signal	NTSC M	JAPAN	1 – 12	13 – 62	M1 ~ M10, S1 ~ S41
		<b>Colour system</b>	<b>Sound system</b>			
		4.43NTSC	5.5/6.0/6.5 MHz			
		PAL 60Hz	5.5/6.0/6.5 MHz			
Colour system (Video input)		PAL / 4.43NTSC / 3.58NTSC / 60 Hz PAL / 50 Hz 3.58NTSC				
Sound output		5 W + 5 W				
Speaker		2 pcs 60 × 120 mm				
Input		VIDEO : 1V (p-p), 75 Ω AUDIO : 500 mV (rms) (54% modulation equivalent), more than 22 kΩ				
Output		VIDEO : 1V (p-p), 75 Ω AUDIO : 500 mV (rms) (54% modulation), less than 2.2 kΩ				
Accessories		Remote Controller × 1 Battery (R6, AA) × 2				

Design and specifications are subject to change without notice.

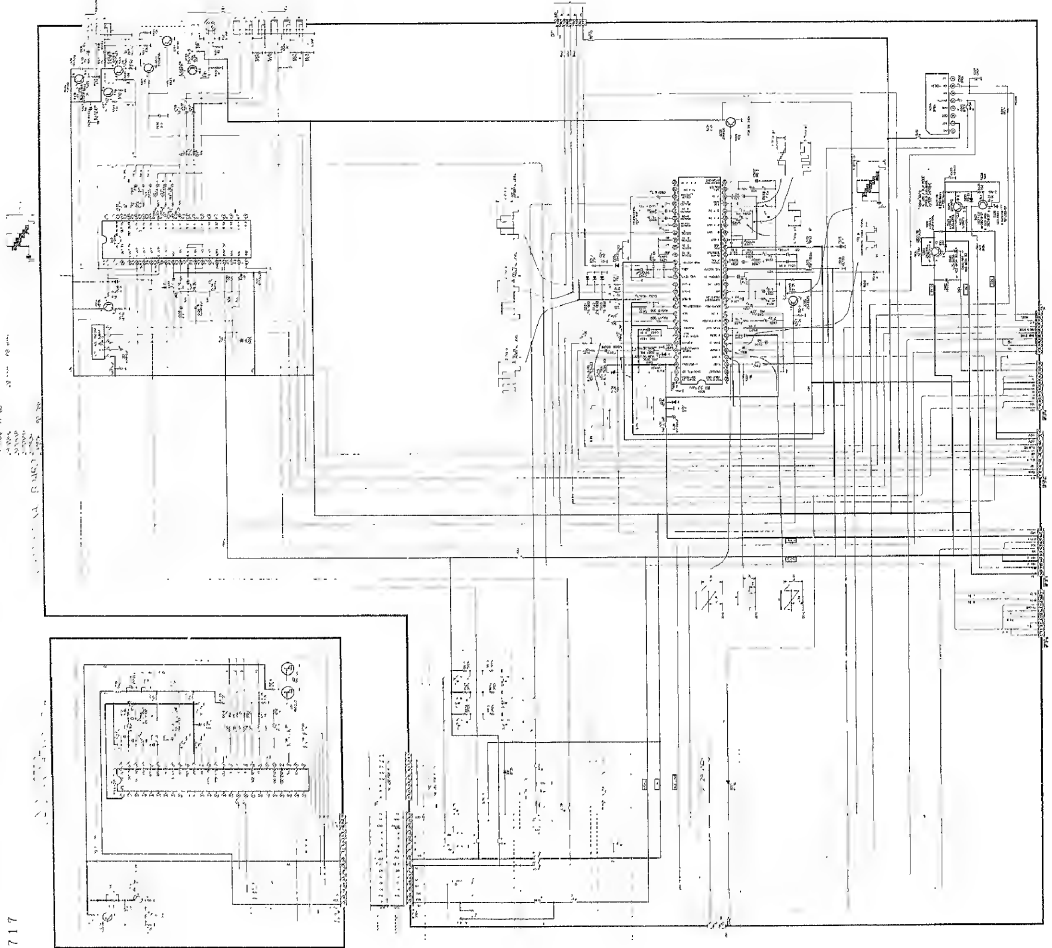
**SCHEMATIC DIAGRAM MODEL : 2975DE / 2975SH (1/2)**

**CAUTION:** The numerical hazard symbol,  $\Delta$ , in the schematic diagram and the list of designated components to be replaced is for the purpose of identifying the components that are to be replaced. It is not intended to indicate that the component is defective or that it is dangerous. The component should be replaced only if it is found to be defective or if it is found to be dangerous.

000 9717

- OBSERVATION OF VOLTAGES AND WAVEFORMS**
1. Measure the voltage at the points indicated in the schematic diagram.
  2. Measure the waveform at the points indicated in the schematic diagram.
  3. Measure the voltage at the points indicated in the schematic diagram.
  4. Measure the waveform at the points indicated in the schematic diagram.

- NOTES**
1. The schematic diagram of the power transformer is shown in the schematic diagram.
  2. The schematic diagram of the power transformer is shown in the schematic diagram.
  3. The schematic diagram of the power transformer is shown in the schematic diagram.
  4. The schematic diagram of the power transformer is shown in the schematic diagram.
  5. The schematic diagram of the power transformer is shown in the schematic diagram.

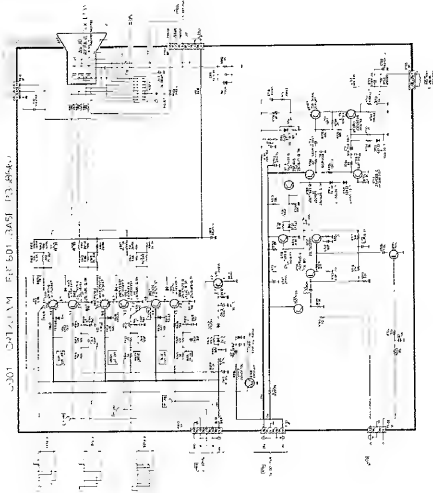


**EXPRESSION**

**VALUE OF RESISTOR, CAPACITOR AND INDUCTOR**

1. Resistor value is indicated by the number in the schematic diagram.
2. Capacitor value is indicated by the number in the schematic diagram.
3. Inductor value is indicated by the number in the schematic diagram.

000 9717



Component	Value	Location
R1	100K	100K
R2	100K	100K
R3	100K	100K
R4	100K	100K
R5	100K	100K
R6	100K	100K
R7	100K	100K
R8	100K	100K
R9	100K	100K
R10	100K	100K
R11	100K	100K
R12	100K	100K
R13	100K	100K
R14	100K	100K
R15	100K	100K
R16	100K	100K
R17	100K	100K
R18	100K	100K
R19	100K	100K
R20	100K	100K
R21	100K	100K
R22	100K	100K
R23	100K	100K
R24	100K	100K
R25	100K	100K
R26	100K	100K
R27	100K	100K
R28	100K	100K
R29	100K	100K
R30	100K	100K
R31	100K	100K
R32	100K	100K
R33	100K	100K
R34	100K	100K
R35	100K	100K
R36	100K	100K
R37	100K	100K
R38	100K	100K
R39	100K	100K
R40	100K	100K
R41	100K	100K
R42	100K	100K
R43	100K	100K
R44	100K	100K
R45	100K	100K
R46	100K	100K
R47	100K	100K
R48	100K	100K
R49	100K	100K
R50	100K	100K
R51	100K	100K
R52	100K	100K
R53	100K	100K
R54	100K	100K
R55	100K	100K
R56	100K	100K
R57	100K	100K
R58	100K	100K
R59	100K	100K
R60	100K	100K
R61	100K	100K
R62	100K	100K
R63	100K	100K
R64	100K	100K
R65	100K	100K
R66	100K	100K
R67	100K	100K
R68	100K	100K
R69	100K	100K
R70	100K	100K
R71	100K	100K
R72	100K	100K
R73	100K	100K
R74	100K	100K
R75	100K	100K
R76	100K	100K
R77	100K	100K
R78	100K	100K
R79	100K	100K
R80	100K	100K
R81	100K	100K
R82	100K	100K
R83	100K	100K
R84	100K	100K
R85	100K	100K
R86	100K	100K
R87	100K	100K
R88	100K	100K
R89	100K	100K
R90	100K	100K
R91	100K	100K
R92	100K	100K
R93	100K	100K
R94	100K	100K
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R97	100K	100K
R98	100K	100K
R99	100K	100K
R100	100K	100K

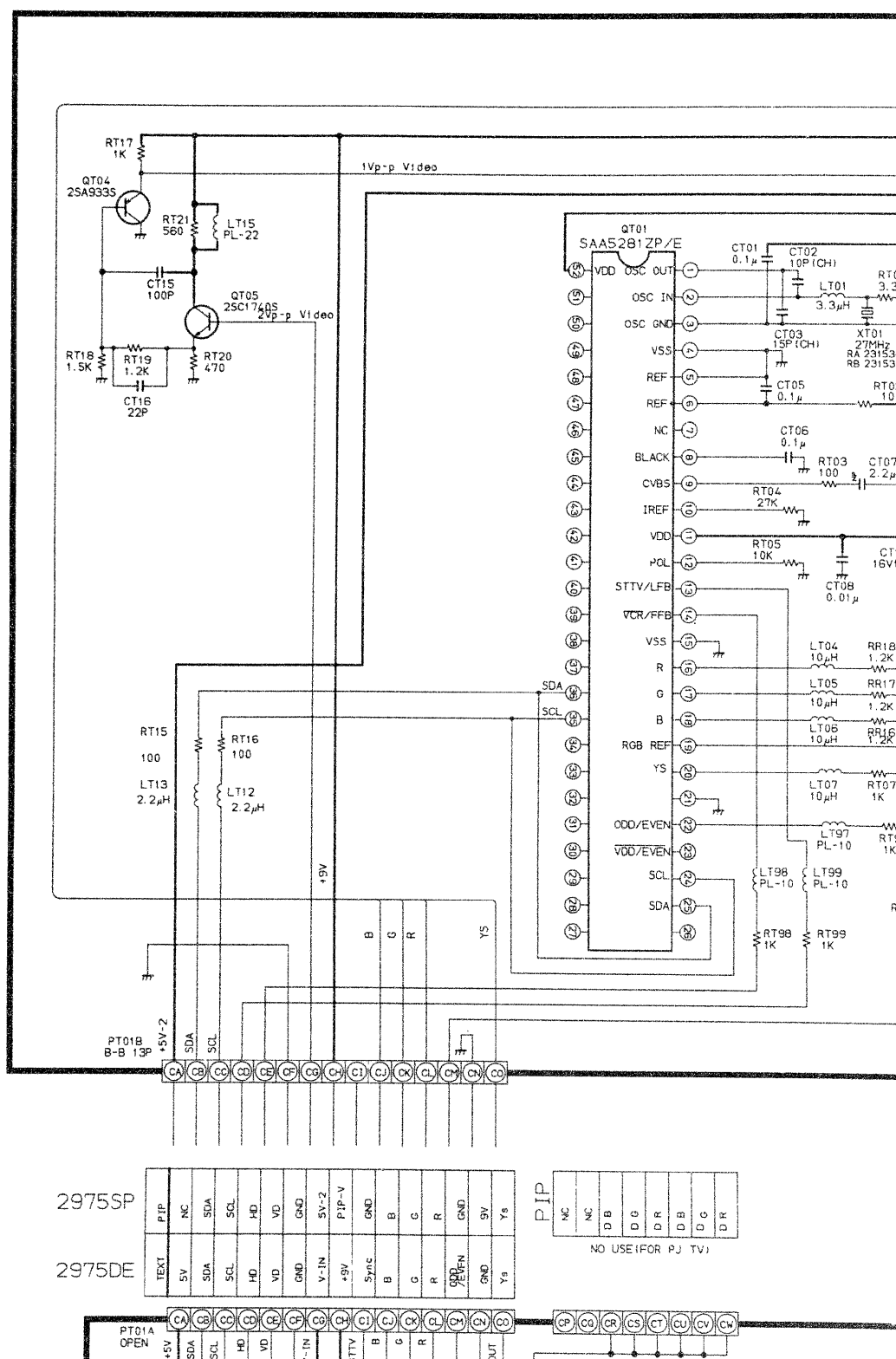
**MODEL : 2975DE / 2975SH**

**CAUTION:** The international hazard symbols “⚠” in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical to the originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE.

3. Do not degrade the safety of the receiver through improper servicing.

060-9717

ONLY 2975DE  
U904 TEXT BOARD PB7



# 2975SH (1/2)

parts list designate com-  
d only with types identical to  
elements is to be identical  
T SAFETY NOTICE on page

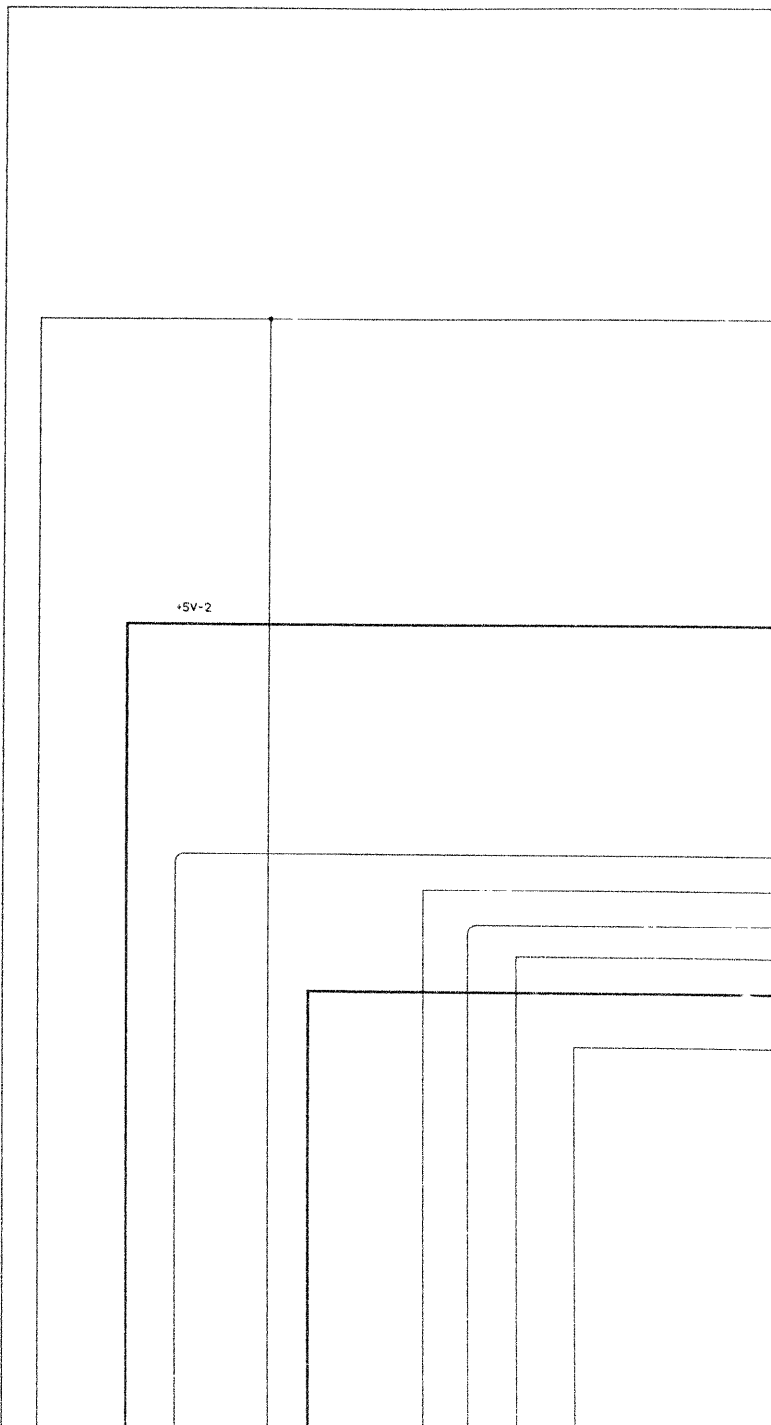
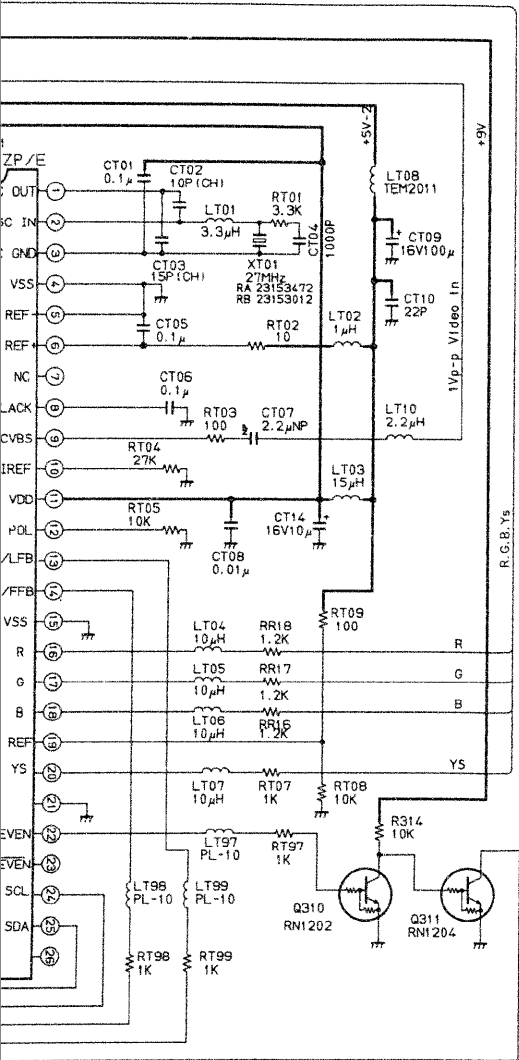
## OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltages read with VTVM from point shown to chassis ground, line volts, colour bar signal. Voltages reading may vary  $\pm 20\%$ .
2. All waveforms are taken using a wide band oscilloscope and a low ca
3. Waveforms are taken using a standard colour bar signal.
4. Make sure that CONTRAST and COLOUR controls are in mid BRIGHTNESS control is almost in maximum position. Set other con picture.

75DE  
KT BOARD PB7045


U902 SIGNAL BOARD

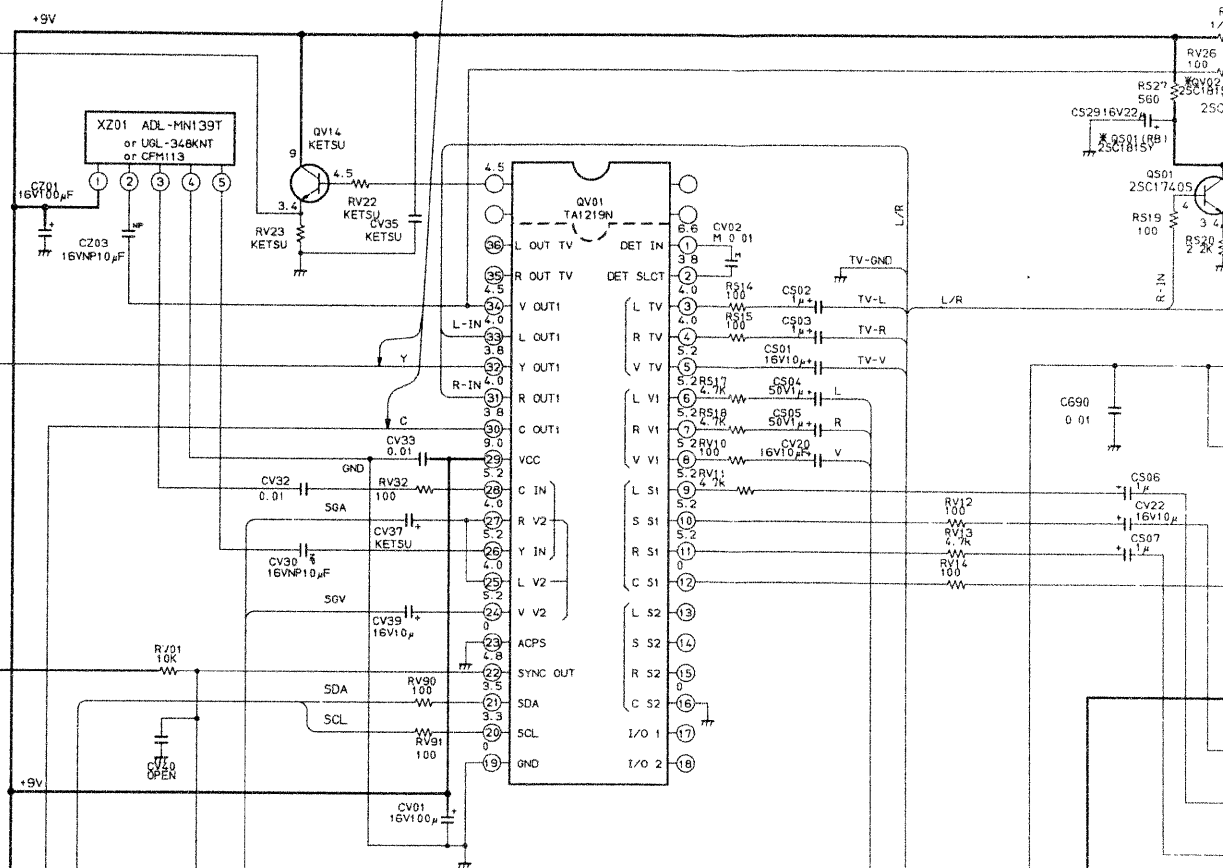
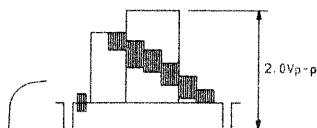
2970XHE PB7045  
2970SHC  
29705XP  
2970XMJ  
2975DH  
2975DE PB7045



ols are in mid position and  
on. Set other controls for best

2975DE PB7786

1. D.C. resistance value of a principal transformer is shown in the program. These are measured for separated from the circuit.
2. The circuits are subject to change without notice.
3.  : Solder links.

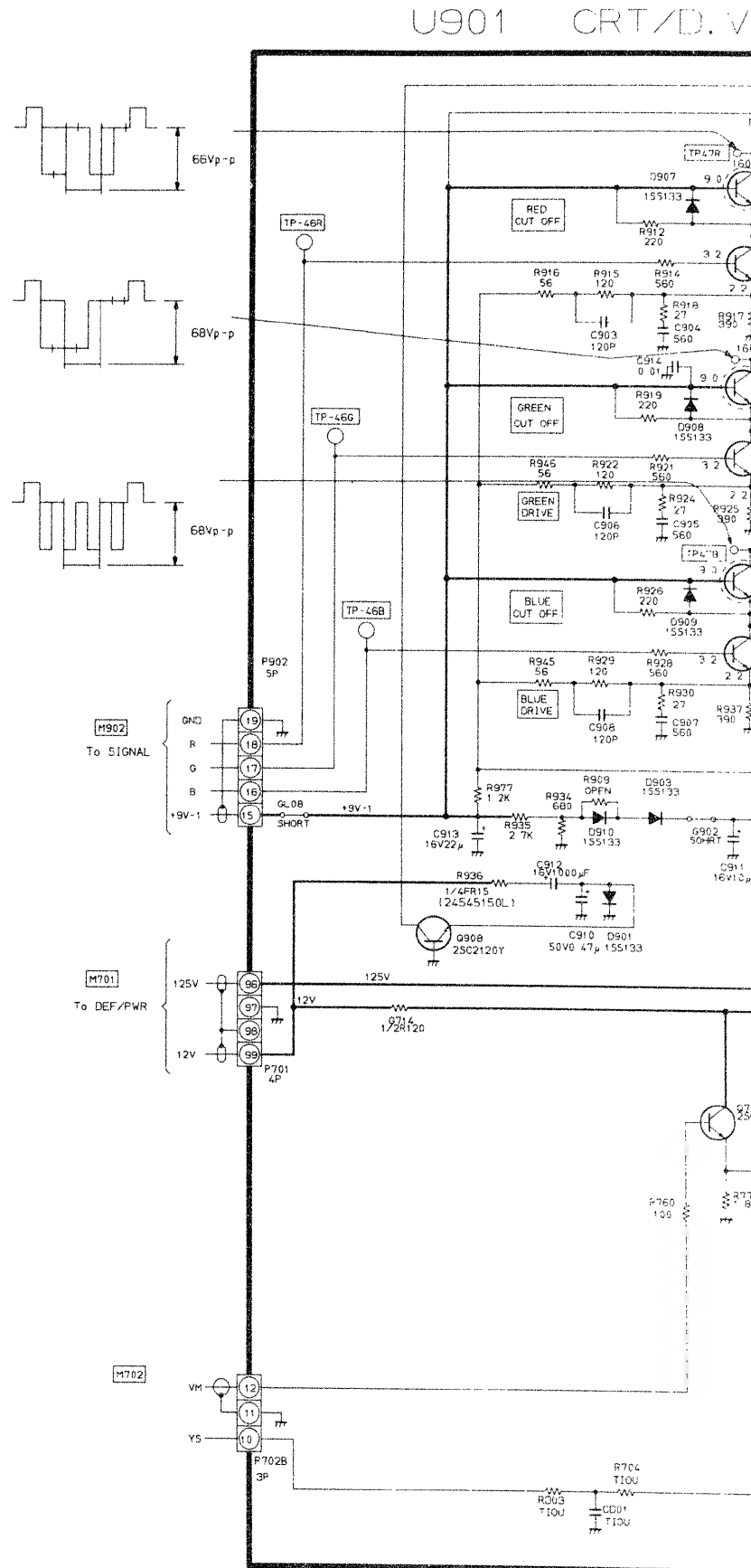
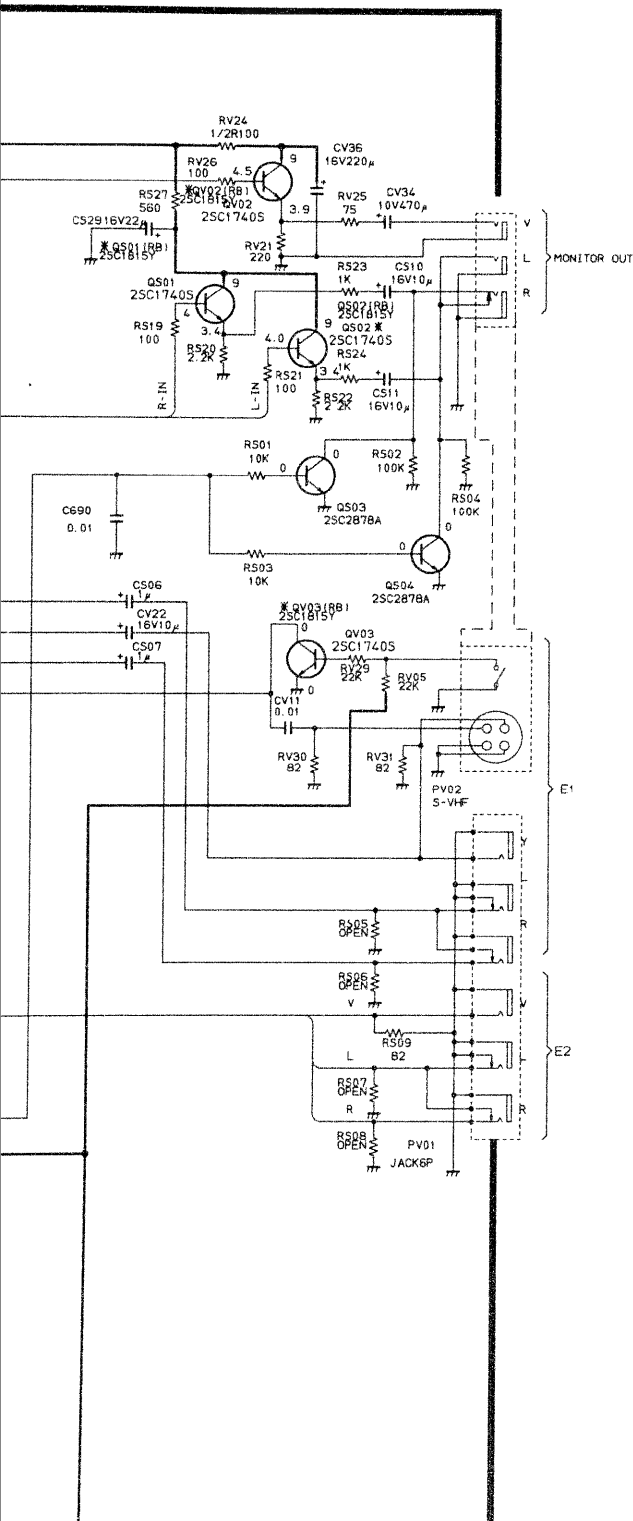


## EXPRESSION

### VALUE OF RESISTOR, CAPACITOR and I

1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless other wise noted in schematic, all ca sed in  $\mu\text{F}$  and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all ind sed in  $\mu\text{H}$ , and the values less than 1 in H.

Transformer is shown in this schematic dia-  
d from the circuit.  
out notice.





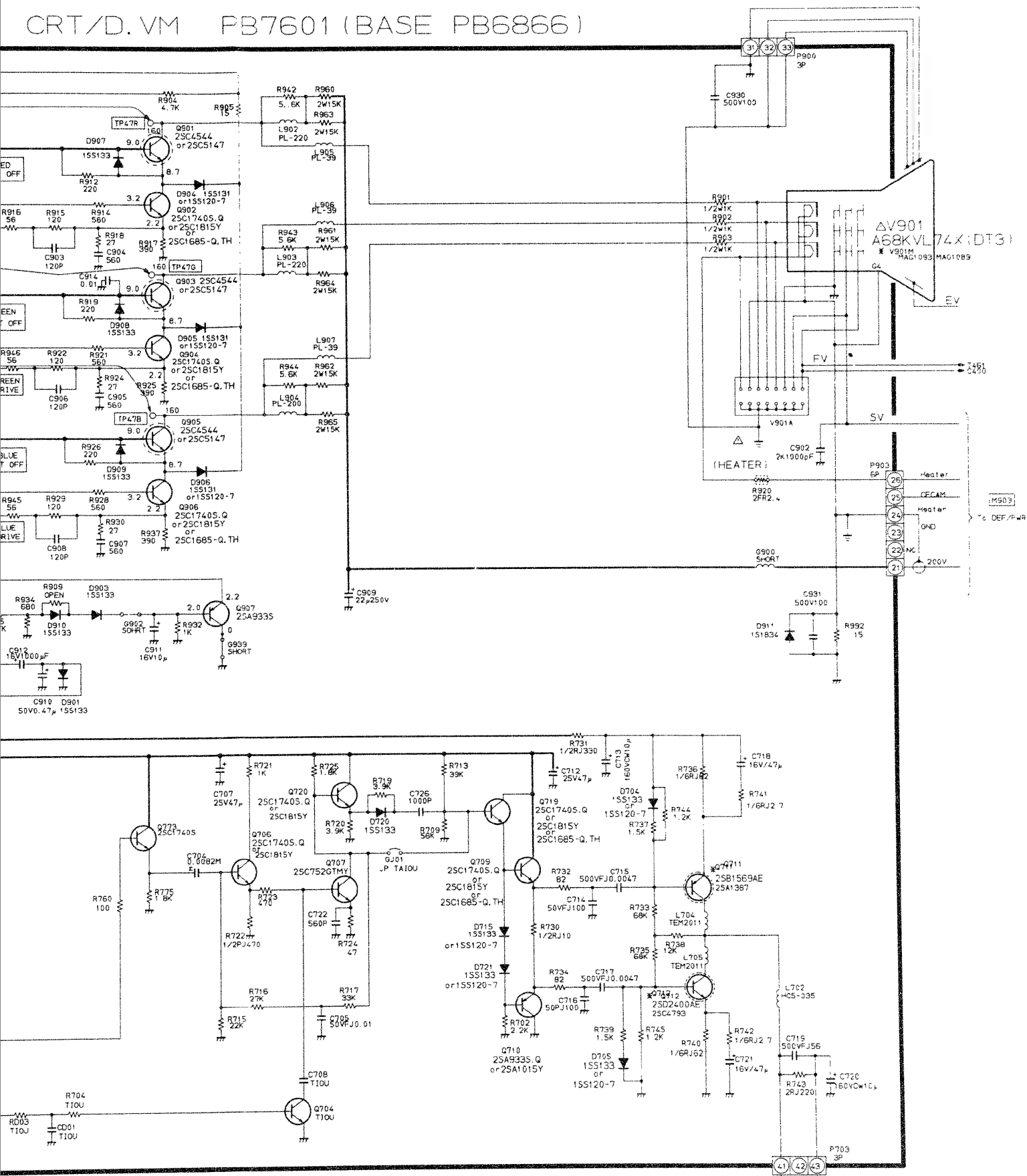
# ACITOR and INDUCTOR

k=1,000, M=1,000,000

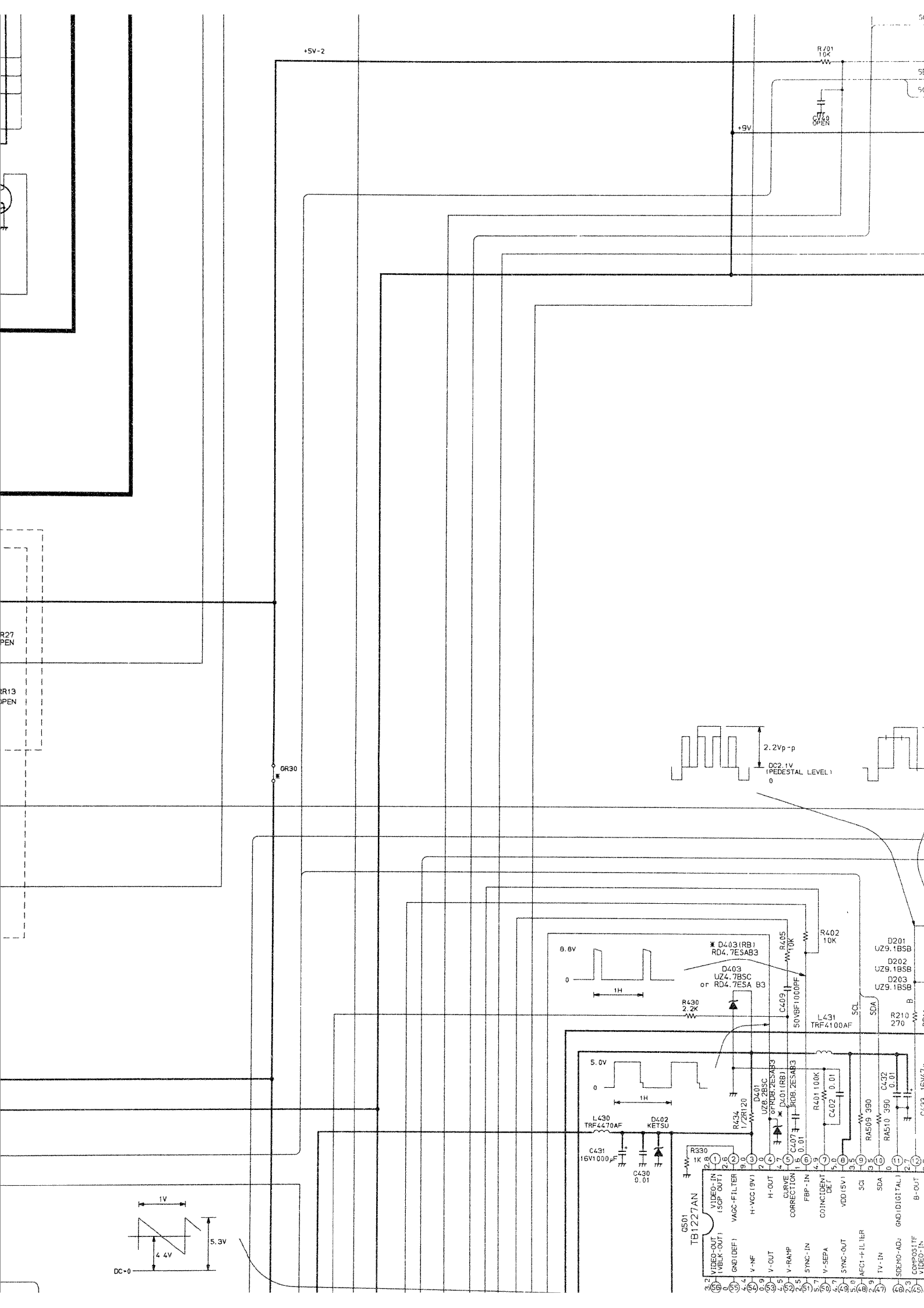
schematic, all capacitor values less than 1 are expressed in pF.

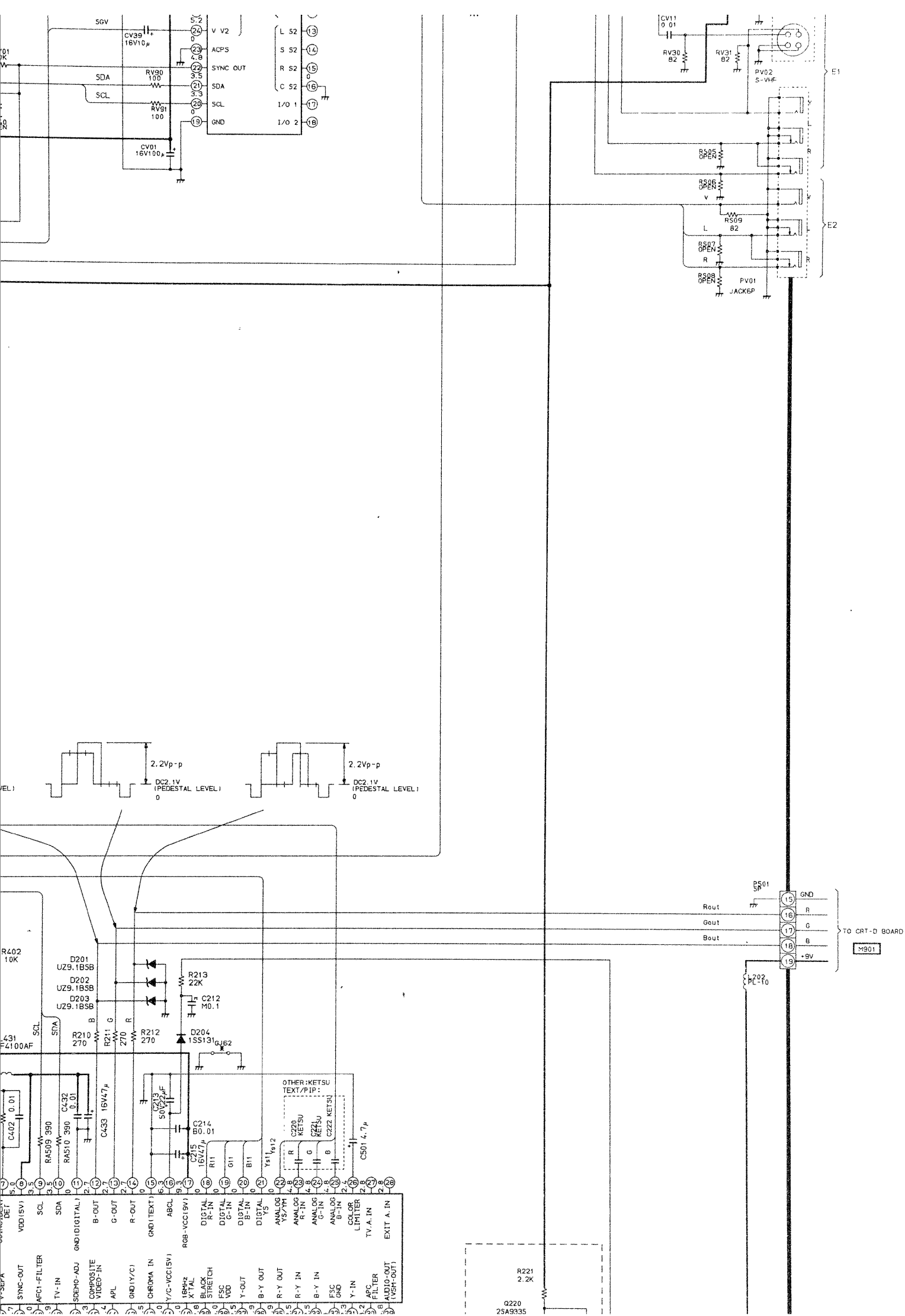
schematic, all inductor values more than 1 are expressed in H.

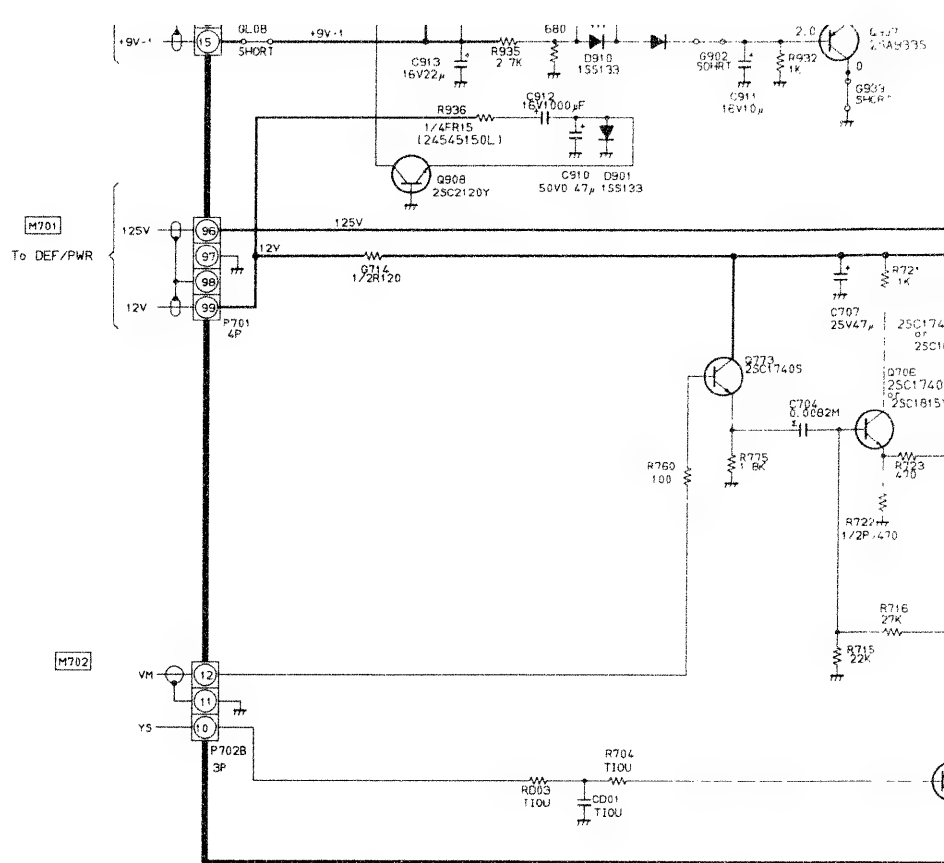
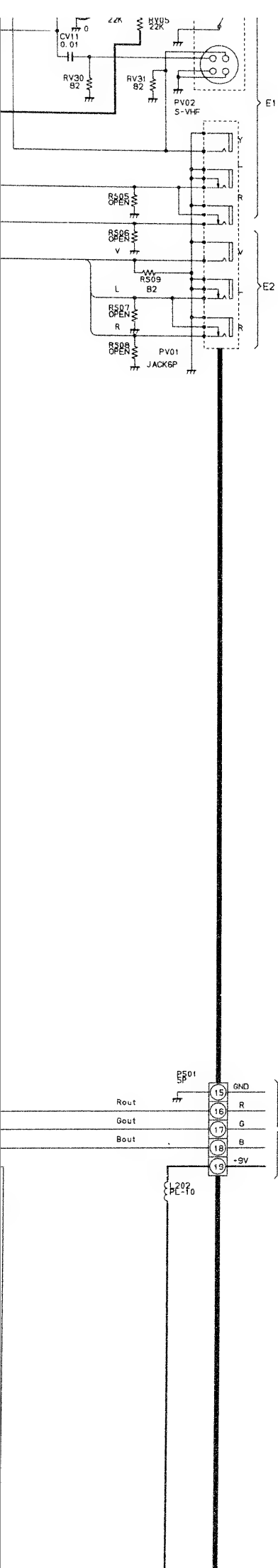
CRT/D.VM PB7601 (BASE PB6866)

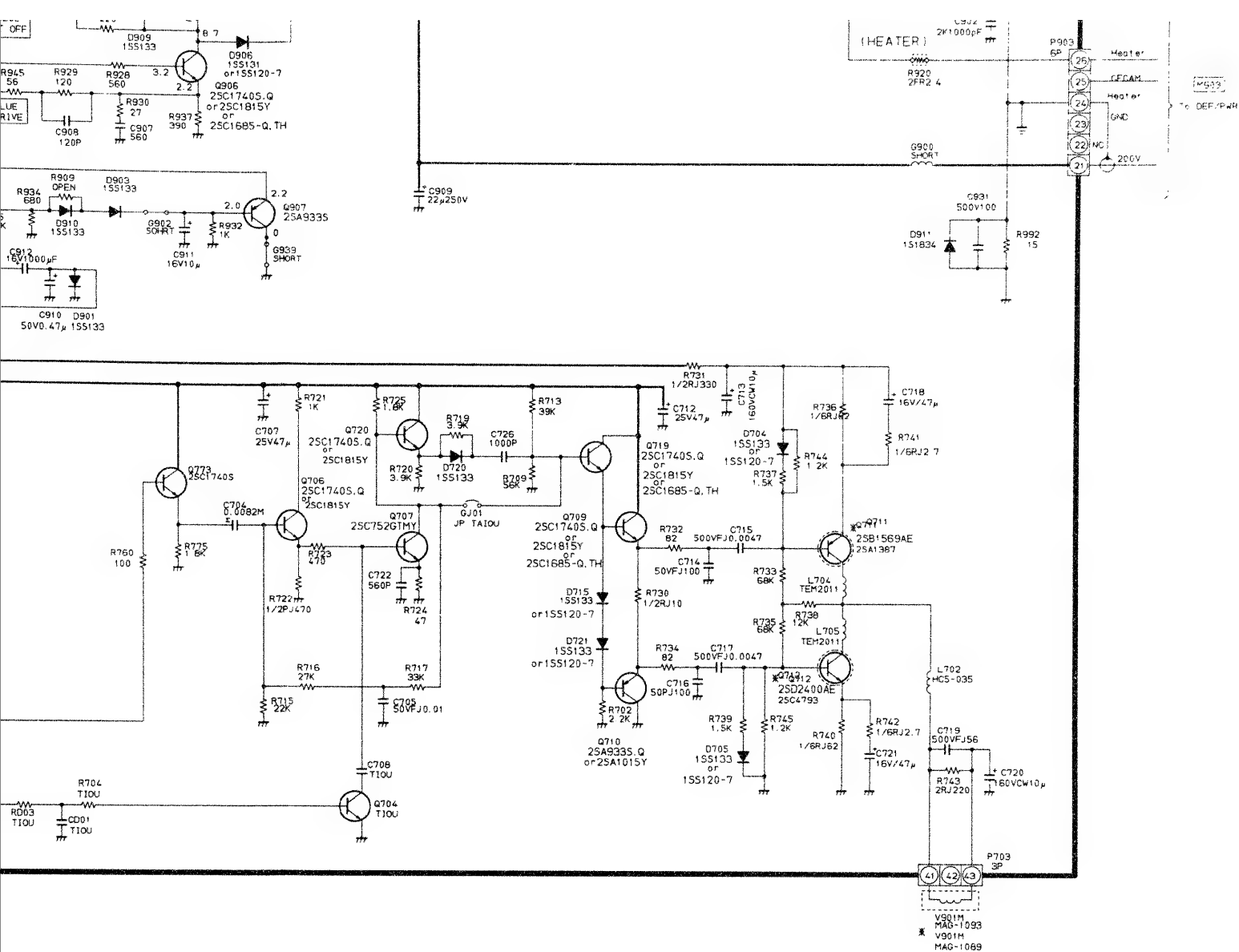


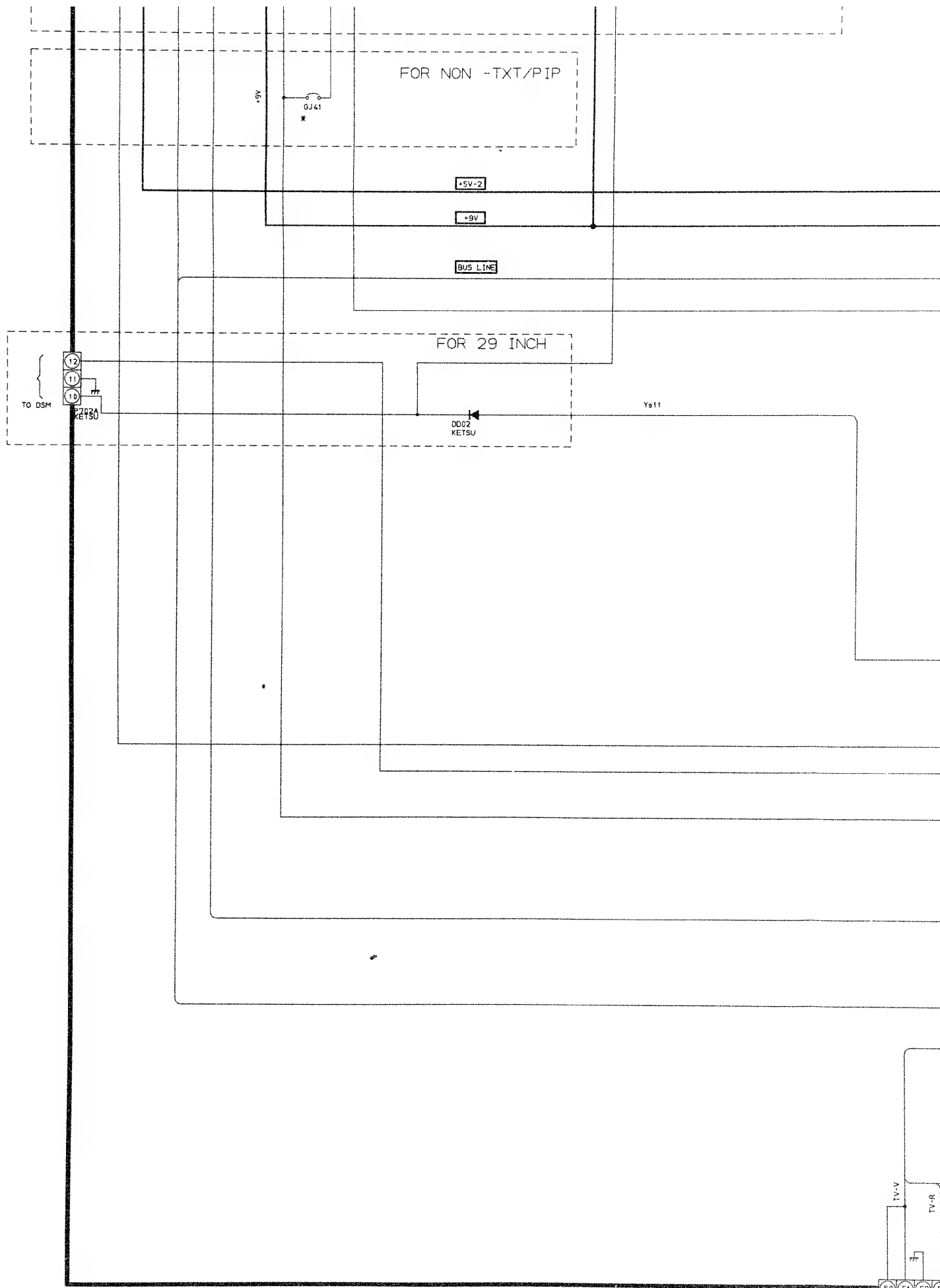


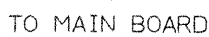




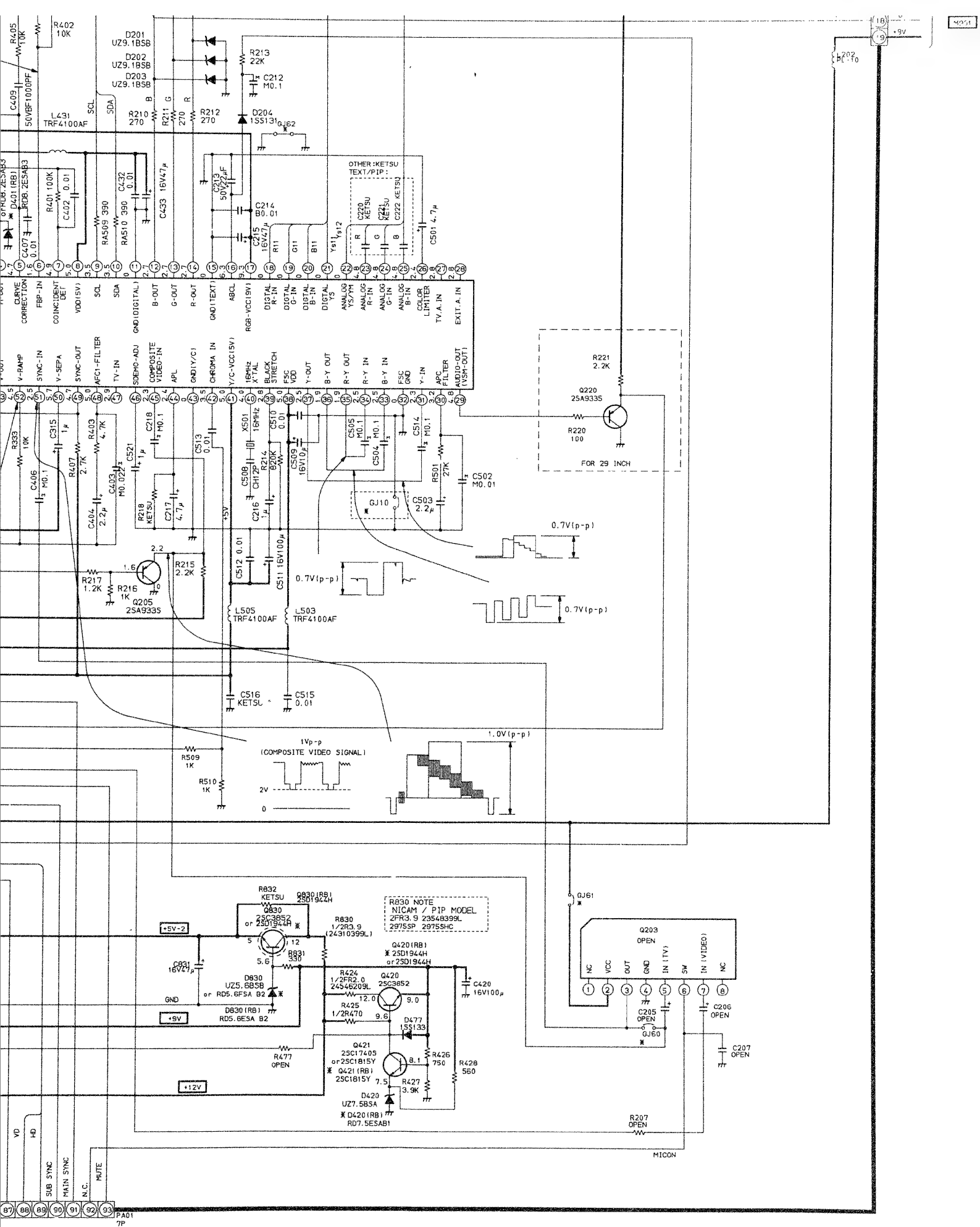












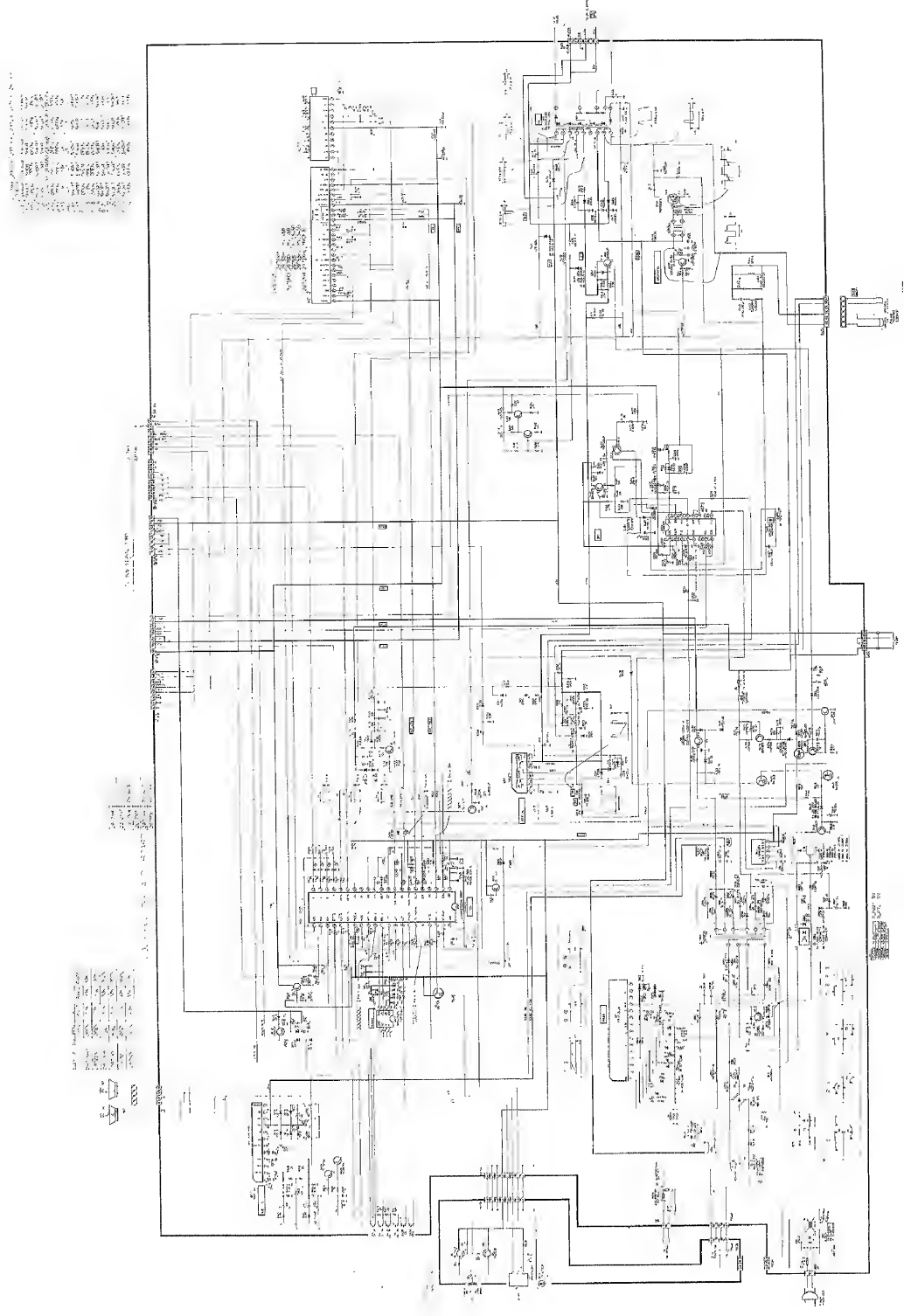
	2970XHE 2970MH	2975SP	2975XHC	2975DE	2975SH	2970XMJ
GJ11	OPEN	SHORT	OPEN	OPEN	OPEN	
GJ16	OPEN	SHORT	OPEN	OPEN	OPEN	
GJ17	OPEN	SHORT	OPEN	OPEN	OPEN	
GJ18	OPEN	SHORT	OPEN	OPEN	OPEN	
GJ20	OPEN	SHORT	OPEN	SHORT	OPEN	
GJ21	OPEN	OPEN	OPEN	SHORT	OPEN	
GJ22	OPEN	OPEN	OPEN	SHORT	OPEN	
GJ23	OPEN	OPEN	OPEN	SHORT	OPEN	
GJ24	OPEN	SHORT	OPEN	SHORT	OPEN	
GJ25	OPEN	SHORT	OPEN	SHORT	OPEN	
GJ26	OPEN	SHORT	OPEN	SHORT	OPEN	
RR27	OPEN	1.8K	OPEN	OPEN	OPEN	
RR28	OPEN	1.8K	OPEN	OPEN	OPEN	
RR29	OPEN	1.8K	OPEN	OPEN	OPEN	
RR13	OPEN	OPEN	OPEN	120	OPEN	
RR14	OPEN	OPEN	OPEN	120	OPEN	
RR15	OPEN	OPEN	OPEN	120	OPEN	
GJ27	OPEN	OPEN	OPEN	SHORT	OPEN	
GJ29	OPEN	SHORT	OPEN	SHORT	OPEN	
GJ30	OPEN	SHORT	OPEN	SHORT	OPEN	
GJ31	OPEN	OPEN	OPEN	SHORT	OPEN	
GJ41	SHORT	OPEN	SHORT	OPEN	OPEN	
GJ51	OPEN	SHORT	OPEN	SHORT	OPEN	
GJ52	OPEN	SHORT	OPEN	SHORT	OPEN	
GJ54	OPEN	SHORT	OPEN	SHORT	OPEN	

	2970XHE 2970MH	2975SP	2975XHC	2975DE
GJ56	OPEN	SHORT	OPEN	SHORT
C220	OPEN	0.1	OPEN	104D
C221	OPEN	0.1	OPEN	104D
C222	OPEN	0.1	OPEN	104D
RV22	OPEN	100	OPEN	OPEN
RV23	OPEN	1K	OPEN	OPEN
QV14	OPEN	25C17405	OPEN	OPEN
CV35	OPEN	0.01	OPEN	OPEN
QV01	TA1219N	TA1218N	TA1219N	TA1219N
Q501	TB1227AN	TB1230N	TB1230N	TB1230N
GJ60	SHORT	SHORT	SHORT	SHORT
GJ61	OPEN	OPEN	OPEN	OPEN
GJ62	OPEN	OPEN	OPEN	OPEN
GV01	SHORT	SHORT	SHORT	SHORT
GV02	SHORT	SHORT	SHORT	SHORT
GY01	OPEN	330	SHORT	OPEN
GY19	OPEN	1K	OPEN	OPEN
GR42	OPEN	SHORT	OPEN	OPEN
RY13	OPEN	10K	OPEN	OPEN
RR11	SHORT	OPEN	SHORT	SHORT

	2975DE	2975SH	2970XMJ
	OPEN	OPEN	
	OPEN	OPEN	
	OPEN	OPEN	
	OPEN	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	OPEN	OPEN	
	OPEN	OPEN	
	OPEN	OPEN	
	120	OPEN	
	120	OPEN	
	120	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	OPEN	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	
	SHORT	OPEN	

	2970XHE	2975SP	2975XHC	2975DE	2975SH	2970XMJ
	2970MH					
GJ56	OPEN	SHORT	OPEN	SHORT	OPEN	
C220	OPEN	0.1	OPEN	104D	OPEN	
C221	OPEN	0.1	OPEN	104D	OPEN	
C222	OPEN	0.1	OPEN	104D	OPEN	
RV22	OPEN	100	OPEN	OPEN	OPEN	
RV23	OPEN	1K	OPEN	OPEN	OPEN	
QV14	OPEN	25C17405	OPEN	OPEN	OPEN	
CV35	OPEN	0.01	OPEN	OPEN	OPEN	
QV01	TA1219N	TA1218N	TA1219N	TA1219N	TA1219N	
Q501	TB1227AN	TB1230N	TB1230N	TB1230N	TB1230N	
GJ60	SHORT	SHORT	SHORT	SHORT	SHORT	
GJ61	OPEN	OPEN	OPEN	OPEN	OPEN	
GJ62	OPEN	OPEN	OPEN	OPEN	OPEN	
GV01	SHORT	SHORT	SHORT	SHORT	SHORT	
GV02	SHORT	SHORT	SHORT	SHORT	SHORT	
GY01	OPEN	330	SHORT	OPEN	OPEN	
GY19	OPEN	1K	OPEN	OPEN	OPEN	
GR42	OPEN	SHORT	OPEN	OPEN	OPEN	
RY13	OPEN	10K	OPEN	OPEN	OPEN	
RR11	SHORT	OPEN	SHORT	SHORT	SHORT	

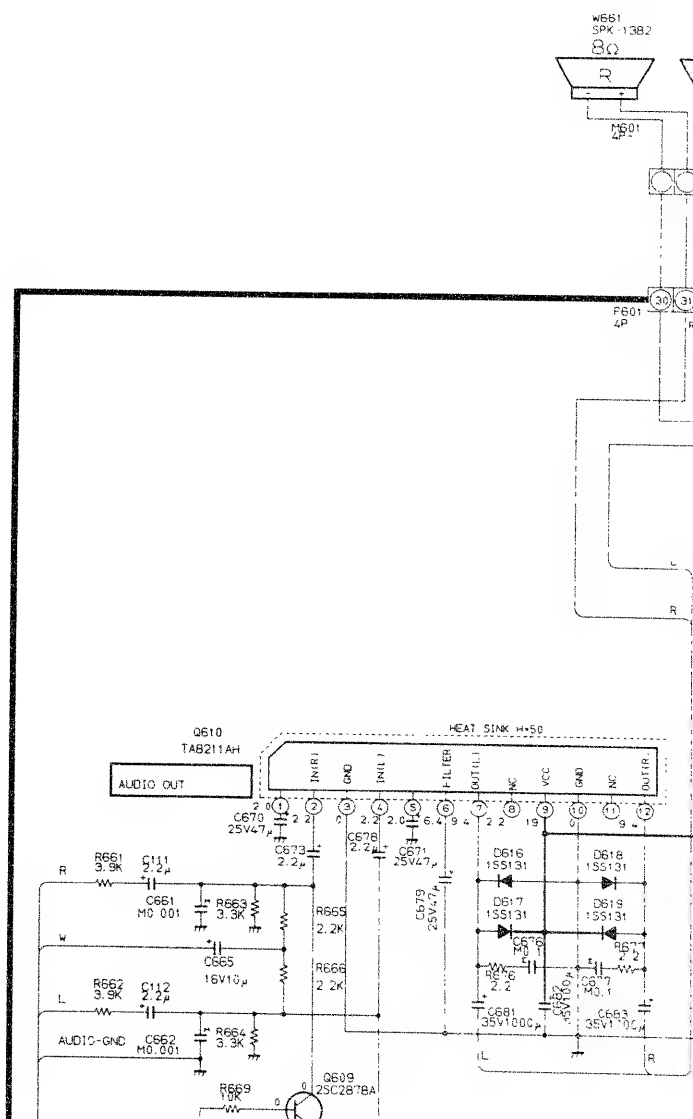
G101  
G102  
G103  
G402  
G406  
G472  
G614  
G615  
G616  
GA60  
GJ05  
GJ12  
GJ14  
GJ15  
GJ50



# SCHEMATIC DIAGRAM

MODEL : 2975DE / 2975SH

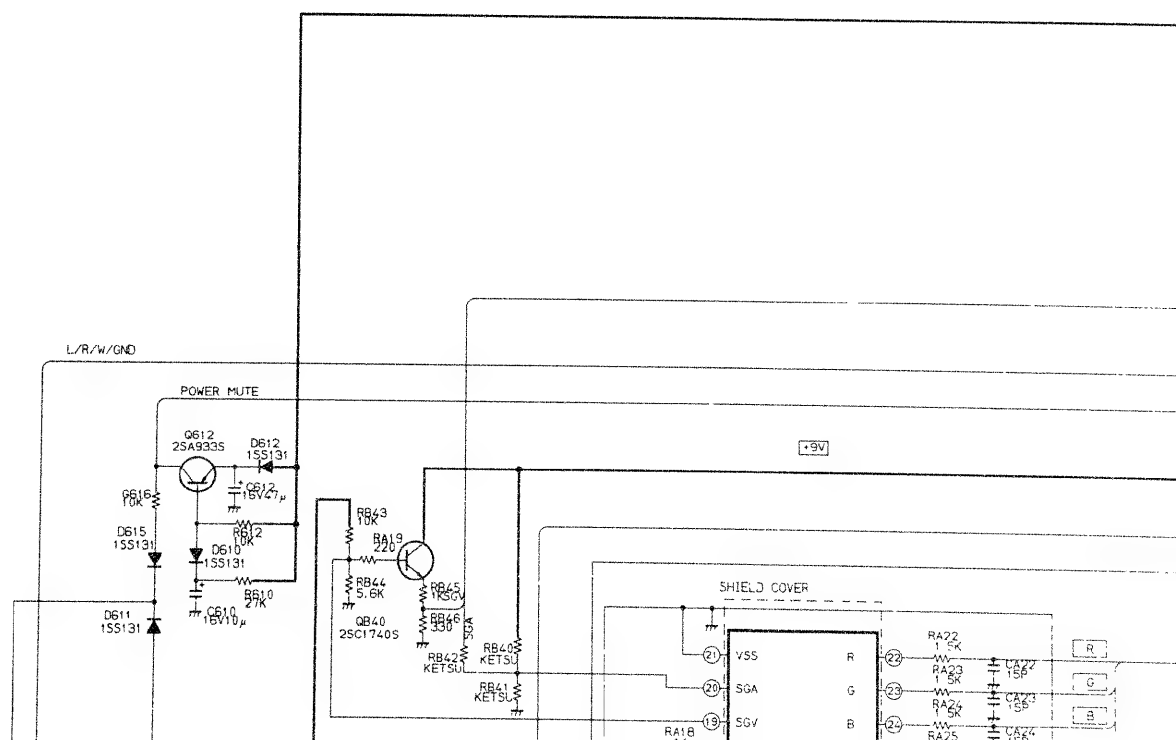
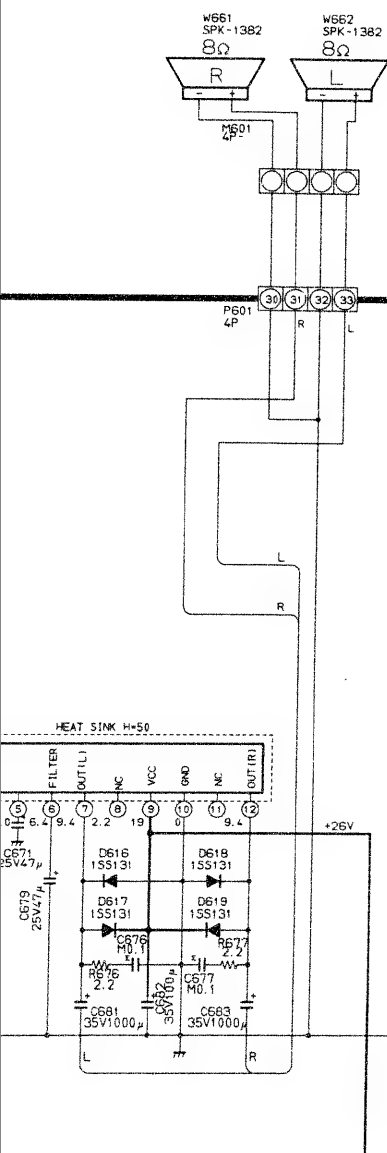
0 6 0 - 9 7 1 7



MODE R DIFFERENCE TABLE

	RA14	RA15	RA64	RA65
2970SHC	OPEN	10K	33K	33K
2970SXP	OPEN	75K	33K	33K
2970XHE	75K	10K	33K	OPEN
2970XMJ	7.5K	10K	33K	OPEN
2975SH	OPEN	10K	33K	OPEN
2975DE	OPEN	43K	33K	33K

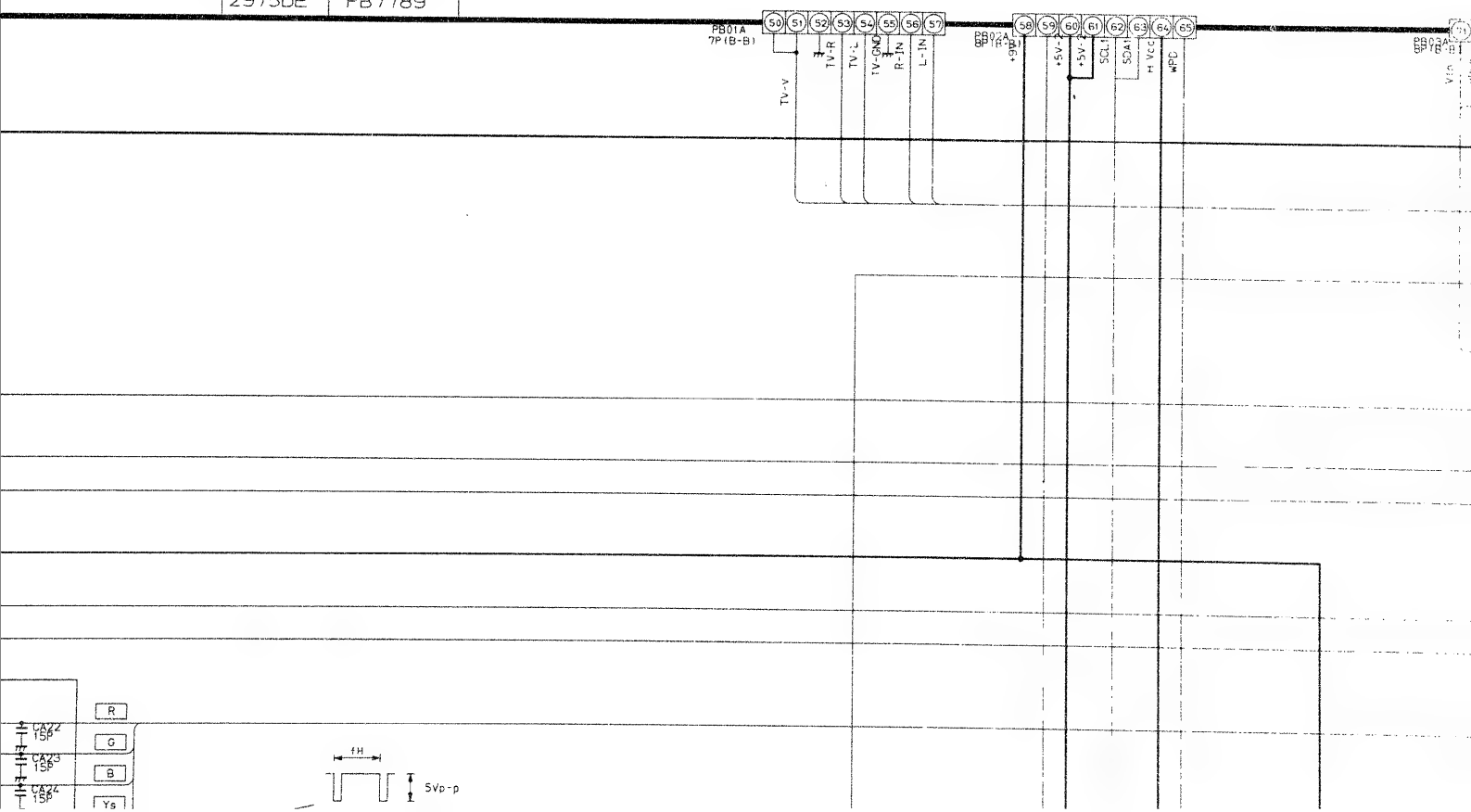
U903 POW/DEF/AUD. BOARD



UD. BOARD

2970SHC	
2970SXP	
2970XHE	PB7603
2970XMJ	
2975SH	PB7697
2975DE	PB7789

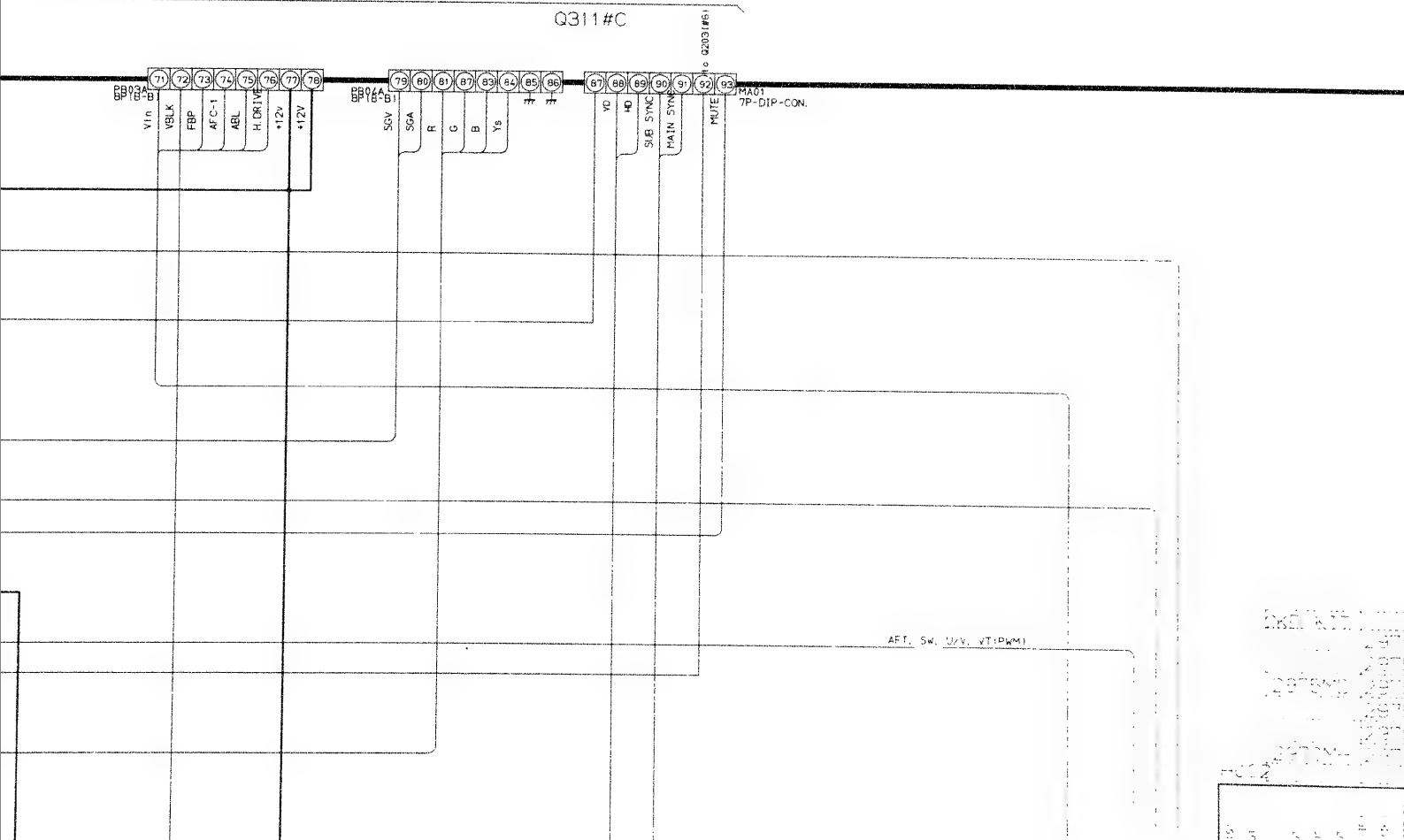
TO SUB-SIGNAL



TO SUB-SIGNAL BORD

to TEXT

Q311#C





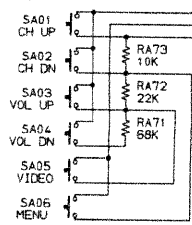
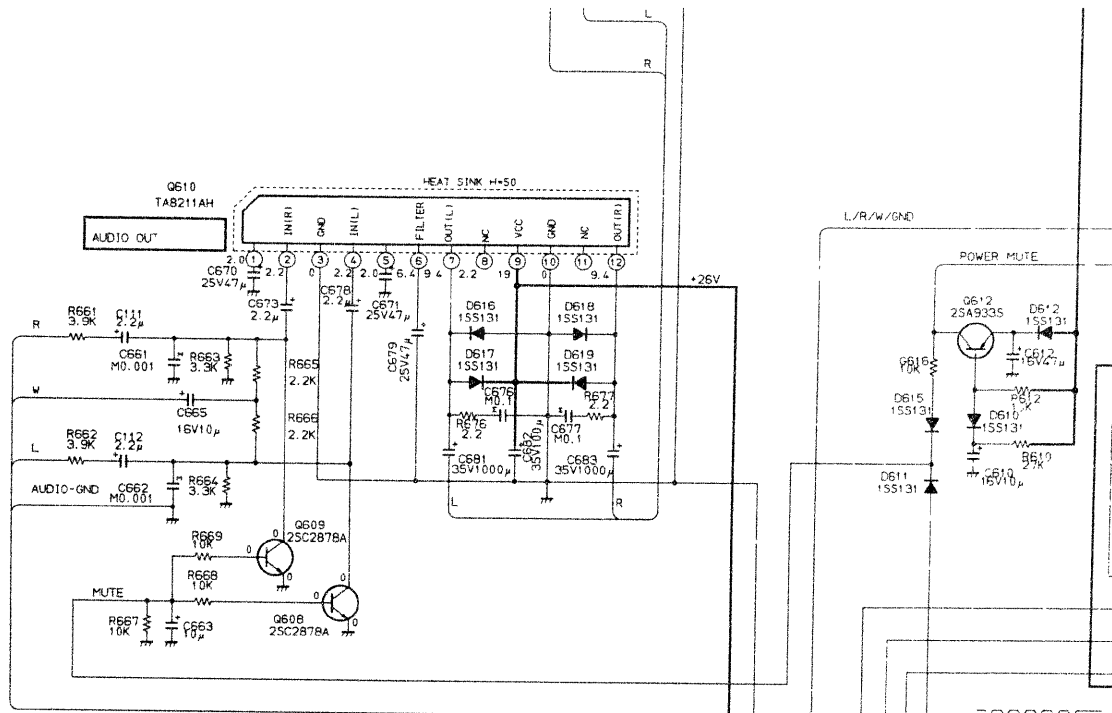
	2970XHE	2975SF	2975XHC	2975DE	2975SM	2975XK
	2970MH					
G101	TLN3040L	TLN3040D	TLN3040D	TLN3040D	TLN3040D	
G102	SHORT	SHORT	SHORT	SHORT	SHORT	
G103	OPEN	OPEN	OPEN	OPEN	OPEN	
G402	SHORT	SHORT	SHORT	SHORT	SHORT	
G406	SHORT	SHORT	SHORT	SHORT	SHORT	
G472	1/2FR681	1/2FR681	1/2FR681	1/2FR681	1/2FR681	
G614	OPEN	OPEN	OPEN	OPEN	OPEN	
G615	OPEN	OPEN	OPEN	OPEN	OPEN	
G616	10K	10K	10K	10K	10K	
GA60	47	47	47	47	47	
GJ05	SHORT	SHORT	SHORT	SHORT	SHORT	
GJ12	SHORT	SHORT	SHORT	SHORT	SHORT	
GJ14	OPEN	OPEN	OPEN	OPEN	OPEN	
GJ15	OPEN	OPEN	OPEN	OPEN	OPEN	
GJ16	OPEN	OPEN	OPEN	OPEN	OPEN	
GJ18	SHORT	SHORT	SHORT	SHORT	SHORT	
GJ21	SHORT	SHORT	SHORT	SHORT	SHORT	
GJ22	SHORT	SHORT	SHORT	SHORT	SHORT	
GJ24	SHORT	SHORT	SHORT	SHORT	SHORT	
GJ50	OPEN	OPEN	OPEN	OPEN	OPEN	
GJ51	SHORT	SHORT	SHORT	SHORT	SHORT	
GJ52	OPEN	OPEN	OPEN	OPEN	OPEN	

PKD.KIT	2970XM	
	2975SH	MVC45B
2975MD	2975DE	MVC45B
	2975SP	MVCS45B
	2975SHC	MVCS45B
2970MH	2970XHE	MVCM31

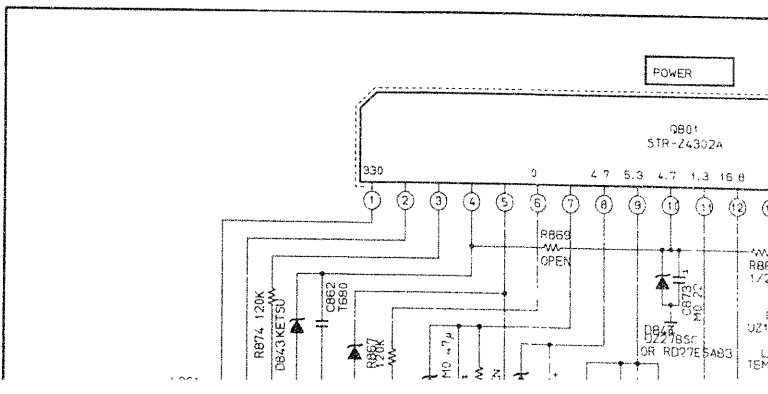
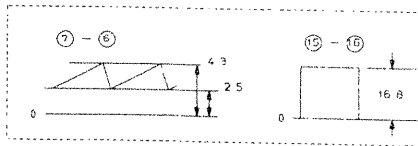
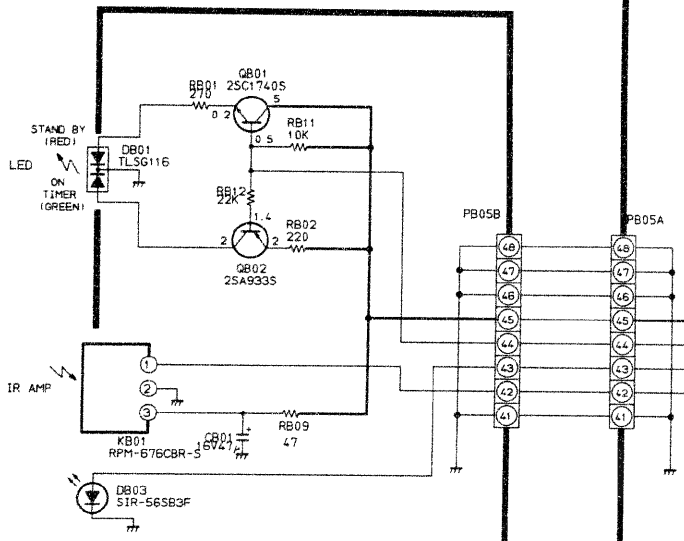
H002

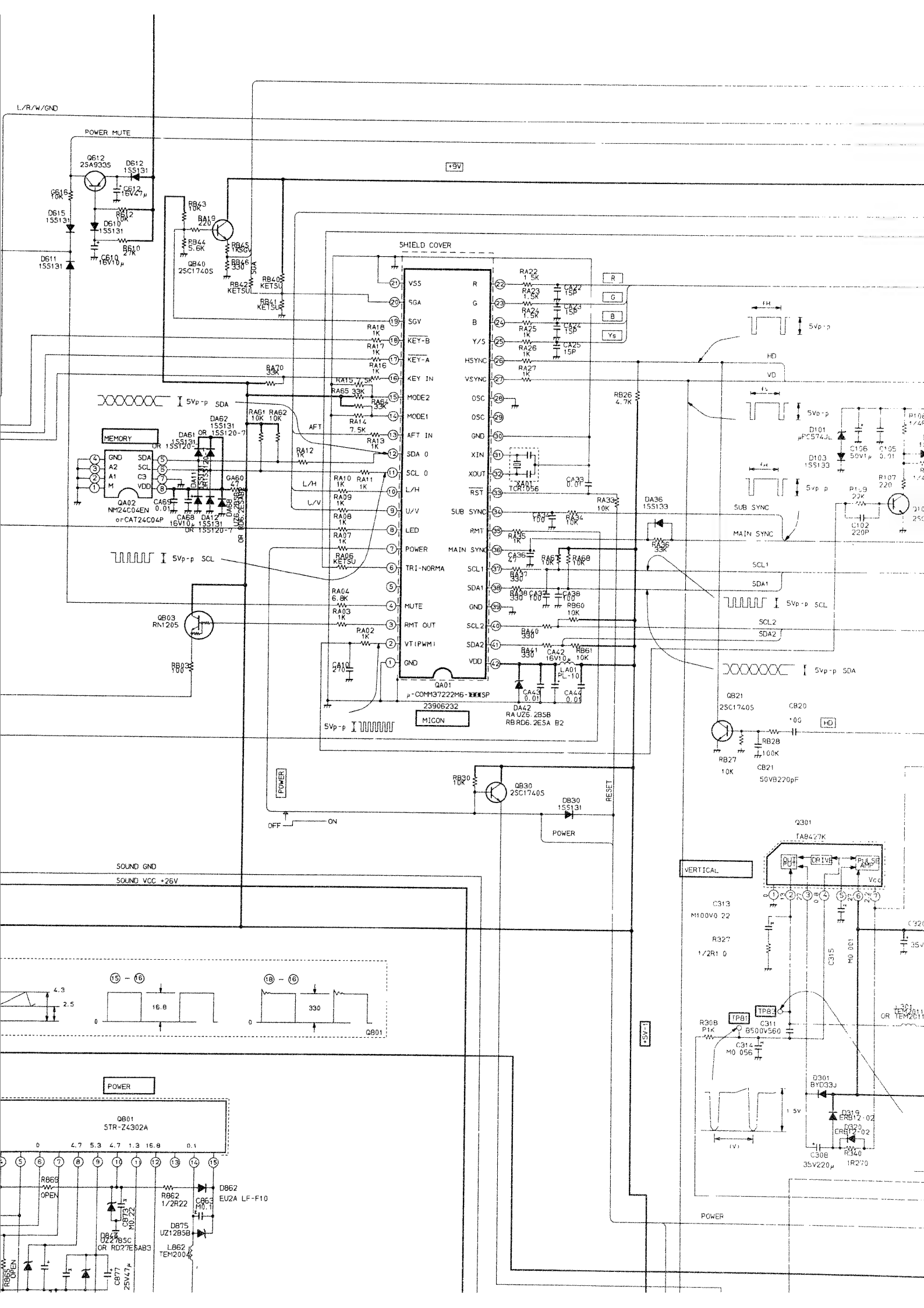
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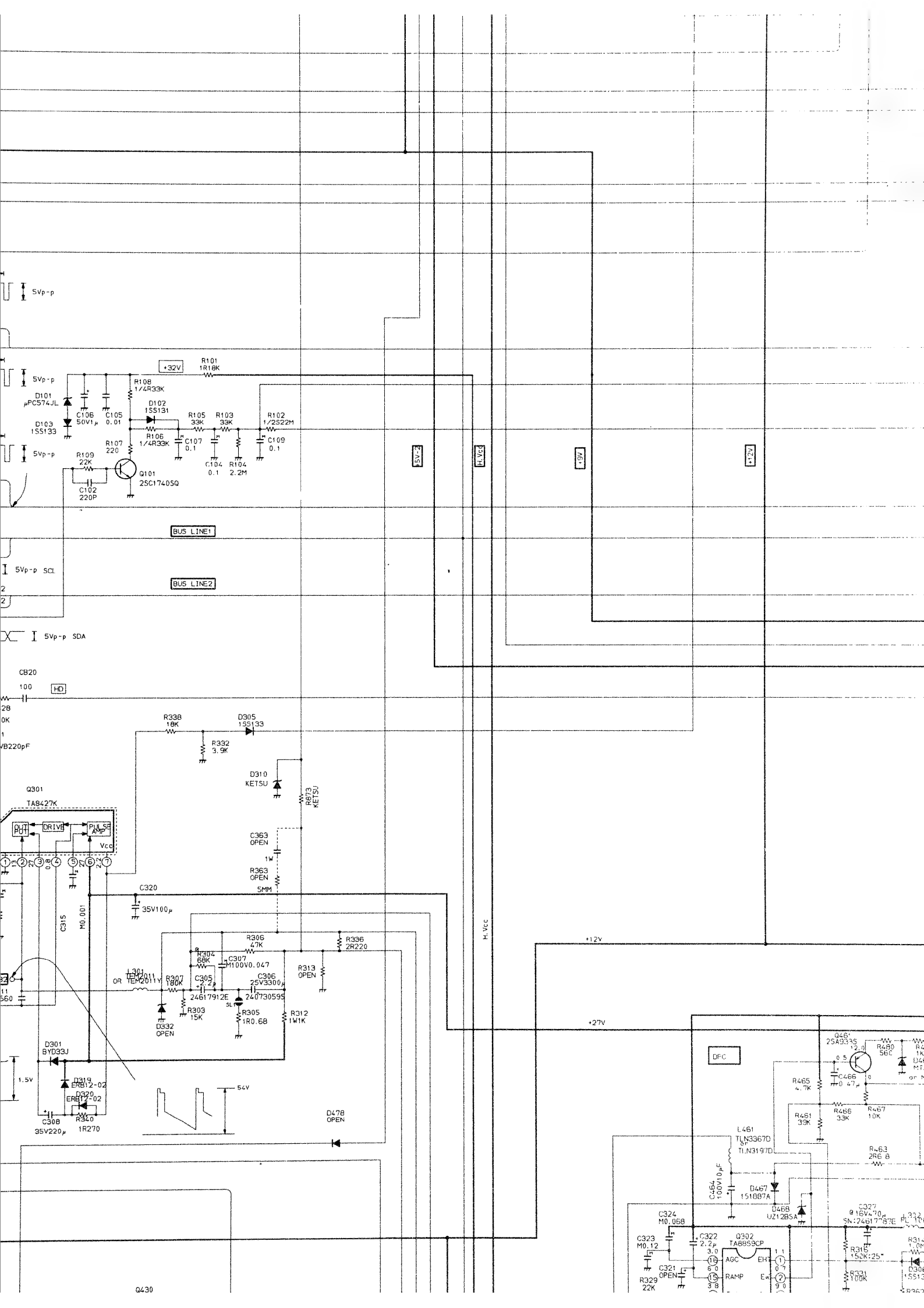
EX-100



PB7604  
COMMON UNIT





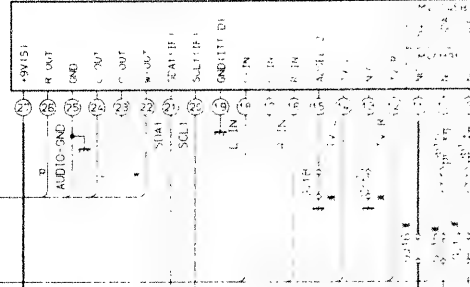


AFT. SW. U/V. VT (PWM)

OKD KIT

2975X  
2975S  
2975M  
2975D  
2975S  
2975S  
2975M  
2975X

H002



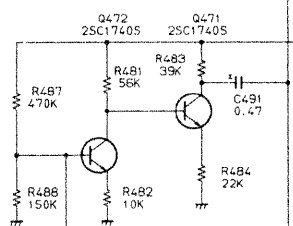
SDA

A.C.D. IN R-IN

+3V

+5V

+12V



FBP

+12V

OR R09 1E5AB7  
OR MTJ29-1C

R475  
1 2P180K

+27V

D475  
U29.1B5A  
OR R09 1E5AB7  
OR MTJ29-1A

C341  
16V100μ

R343 2R1  
R342 5.6K  
R344 3.9K

27 0

Q34C  
25A933S

ABL

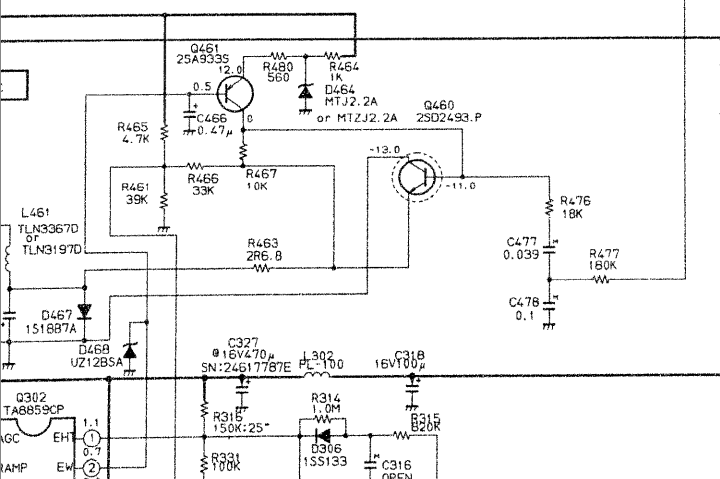
AFC-1

+125V

HORIZONAL

Q402  
25C1569, FA-51  
27 0

250V



Q302  
TA8859CP  
AGC EHT  
AMP EW

R315 150K±25%  
R331 100K  
R314 1.0M  
D306 1SS133  
C316 OPEN

250V



